

Quivira Mining Company

QS

May 10, 1990

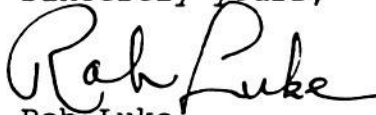
Mr. Myron Knudson, P.E.
United States Environmental Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: EPA's April 13, 1990, Notice Proposing to Add Quivira Mining Company and Dry Arroyo/Arroyo del Puerto to New Mexico's Section 304 Toxic Pollution Lists

Dear Mr. Knudson:

Enclosed please find comments of the Quivira Mining Company in response to the above notice. Your notice did not provide nearly enough time to adequately evaluate and respond to this important and difficult matter. We respectfully request an additional 90 days as the minimum period which will be required in order for Quivira to fairly address the issues involved in this notice. Otherwise, we request that EPA's proposal be withdrawn.

Sincerely yours,


Rob Luke,
President

RPL/pb

Enclosures as noted

12 1990

QUIVIRA MINING COMPANY'S COMMENTS
ON EPA'S PROPOSAL TO LIST THE DRY ARROYO/
ARROYO DEL PUERTO AND QUIVIRA'S AMBROSIA LAKE FACILITY
ON THE CLEAN WATER ACT'S § 304(1)(1)(B) AND (C) LISTS

May 11, 1990

I.. INTRODUCTION AND SUMMARY

These comments are presented by Quivira Mining Company (Quivira) in response to the Environmental Protection Agency's (EPA) April 14, 1990 notification to the state of New Mexico and Quivira that the Dry Arroyo/Arroyo del Puerto and Quivira's Ambrosia Lake facility (regulated under NPDES Permit No. NM0020532) were being considered for inclusion on the Clean Water Act § 304(1)(1)(B) and (C) lists, respectively. Quivira has procedural, scientific and substantive objections to EPA's proposed action. Procedurally, the EPA failed to meet its statutory and regulatory deadlines for inclusion of water reaches and facilities on the (B) and (C) lists, and its untimely action has now deprived the State of its rightful role in determining which reaches of water in New Mexico belong on the various lists. Furthermore, the inadequately short notice for comments on the proposed action has deprived Quivira of a fair opportunity to study and to develop all of its potential comments and arguments against the proposed action.

Quivira objects to the EPA's use of what it believes may be an outdated § 304(a)(1) water quality criteria as the "applicable standard" which Quivira would be expected to achieve under an individual control strategy. A growing body of scientific evidence, including EPA's proposals for relaxing drinking water standards, suggests that the EPA's selenium water quality criteria for livestock and irrigation are based on an overstated risk assessment of the element. Quivira suggests instead that the question of the real environmental impact of its discharges should be explored before any listing action is taken, given Quivira's unusual situation outlined herein, and the serious consequences such a listing entails to the Company.

Quivira also objects to EPA's proposed action on two major substantive grounds. First, inclusion of the Ambrosia Lake facility on the (C) list would not appear to promote the Congressional goal underlying § 304(1) of the Clean Water Act, which is to achieve applicable water quality standards for all navigable waters including the Arroyo del Puerto. Both ground and surface water in the area where the facility is located are naturally loaded with selenium because of the particularly high concentration of selenium in the immediate area as well as the generally high selenium content of the entire mineralized region. This natural heavy background load of selenium may well preclude achievement of applicable water quality criteria for the Arroyo.

Therefore, imposing any individual control strategy on Quivira would not seem likely to accomplish the purpose of the toxic pollutant control program.

Quivira's second substantive objection to the proposed action is that because of this concentrated natural background load of selenium, Quivira's discharge cannot be said to be entirely or substantially the cause of the Arroyo del Puerto's alleged inability to meet applicable water quality standards, and therefore § 304(l) should not even be applicable in this case.

Quivira's review of the problem indicates that it may be technically impossible for its Ambrosia Lake facility to achieve the applicable water quality standards for selenium through removal of the element from the discharges, and that this would not be economically feasible in any circumstance. Applying such standards may force Quivira to cease operations and allow the facility to permanently flood, with an accompanying loss of jobs and income for the surrounding counties. Furthermore, the EPA's position on discharging groundwater containing naturally occurring selenium may cripple future industrial development in the region.

II. ANALYSIS

- A. The EPA's action is fundamentally wrong, both coming too late in the statutory and regulatory time scheme, and in allowing too short a period of time for public comment on the proposed action.

EPA's action is unreasonably late, coming some fourteen months after the State (in January, 1989) completed its study and decided not to add the Arroyo del Puerto and the Ambrosia Lake facility to the State's "short" and (C) lists, respectively. EPA's untimely action also violates the Clean Water Act and its regulations. The statute, as construed by EPA and its own regulations, required EPA to disapprove the State's decision not to add Quivira and the Arroyo to the list, if at all, within 120 days of the State's submittal of February 4, 1989. 40 C.F.R. § 130.10(d)(8).

EPA's proposed action has also deprived both Quivira and the State of New Mexico from any effective participation in EPA's proposals and decisions regarding these lists, as contemplated by EPA's own regulations, which required at least 120 days advance notice and comment period. 40 C.F.R. § 130.10(d)(10)(vi). This was the period deemed necessary in order to provide opportunity for full participation and response to the proposed action in this serious matter. Instead of 120 days, EPA has limited both Quivira and the State to an insufficient 30 days. EPA did not even comply with its announced and intended 30-day period. The 30 days was actually reduced to less than 3½ weeks because the

EPA notice dated April 14th was not received by the New Mexico Environmental Improvement Division (NMEID) until April 18th nor by Quivira until April 19th which in each case was a full six days after the date of the EPA letters of April 12th and 13th, respectively. See letters attached as Appendix 1. This substantial delay from the normal two day mail service between Dallas and New Mexico suggests that the notices were probably not mailed until after the 30-day period had already started.

Attached hereto as Appendix 2 is a memorandum opinion by the New Mexico law firm of Rodey, Dickason, Sloan, Akin and Robb, P.A., independent counsel for Quivira, concluding that EPA's proposal is invalid as a matter of law because EPA did not follow the Act and its regulations.

As stated earlier, EPA's proposed action denies the State its rightful and central role contemplated by the Act in participating in the program for identifying the waters and point sources which should be on the § 304(l) lists. The proposal also obstructs New Mexico from having input into EPA's proposals and action regarding same. Section 304(l) makes it clear that the development of the lists and control strategies is primarily the State's function, guided by EPA. The State has the initial right and ultimately the vital role in studying these problems and deciding which waters and point sources belong on the lists; and that even where there are disagreements between the State and EPA, EPA has the duty to continue to make its decisions in consultation and cooperation with the State. None of these objectives are met when the EPA denies the State the right to effectively participate in the process by EPA's attempted inclusion of certain waters on the lists at the last possible moment, and by failing to provide both the State and Quivira with an adequate opportunity to comment upon the proposals.

The EPA's untimely and too-short notice period for comment has also denied Quivira and the State the opportunity to fully study the complex problems and to develop their position regarding EPA's proposed action. Attached as Appendix 3 is a list of only a few of the issues which Quivira could have explored and developed had it had more time to comment.

Neither can it be said that Quivira and the State have suffered no damage from EPA's failure to follow the rules, because some or all of the matters which Quivira might raise in the comments at this time may be able to be raised at a later date in NPDES permit proceedings. Placing Quivira on the (C) list puts Quivira at a great disadvantage since it places the problem on an accelerated track for mandatory corrective action within the three year period specified by Congress. It also puts Quivira to the great expense in trying to address an individual control strategy to remove selenium from the waters or to take other steps in that tight time schedule before it has even been legally

determined that Quivira belongs on the list. Once Quivira has been branded as a priority polluter by being placed on the list, it will be much more difficult to remove the Company from the list and required remedial action than if it had had a fair chance to show initially why it does not belong there at all.

B. The EPA's proposed action will have an adverse effect upon Quivira and the economy of the surrounding area.

It cannot be said that the proposed action of EPA is insignificant, or that its violations of both the statute and regulations are trivial, or that the EPA proposal is immaterial to Quivira's operations or to the State of New Mexico. Quivira's Ambrosia Lake facility is the last remaining producing uranium mine in the State of New Mexico. All others have been forced out, or have announced plans to close, because of the extremely depressed market for uranium which has existed for some time. EPA's objective, as it has advised Quivira, is to prevent Quivira from discharging the naturally occurring selenium found in its mine process waters into the Dry Arroyo/Arroyo del Puerto. This means that Quivira must either find some way to remove the selenium from the water (which it does not presently know how to do, either technically or in an economically feasible manner) or must find some way to return the water to the formation from which it was removed, which may only be a temporary solution. The EPA proposal would halt or seriously impede Quivira's plans to continue mining when the uranium market improves and any plans for a future possible expansion of its operations. Such changes of plan would also have harmful effects on the already depressed economies of McKinley and Cibola counties, where Quivira's operations currently provide jobs, both directly and indirectly.

The EPA's proposed action also has broad implications for the mining industry including especially uranium mining and for industrial development (which usually requires the use of groundwater) of the Grants Mineral Belt and in other parts of New Mexico which also contain concentrations of selenium in the soil and in their natural underground and surface waters.

The United States uranium industry has been viewed by the U.S. Congress as a strategically important industry since passage of the Atomic Energy Act of 1954. This is because there are no substitutes for uranium as fuel for the nation's nuclear power reactors, which now provide 20% of U.S. electricity needs, and also because of the importance of uranium to U.S. defense programs.

Historically, the Grants Mineral Belt in New Mexico has been the largest and most important uranium producing area in the United States, accounting for approximately 45% of all domestic uranium production since 1955. The most recent information available on "reasonably assured resources" of uranium, published by the

Energy Information Administration (DOE/EIA-0478) 1988, estimates that 61% of all remaining low cost uranium resources in the U.S. are located in the Grants Mineral Belt in New Mexico. See Appendix 4.

Although the uranium industry both in New Mexico and nationwide has contracted in recent years, as large excess inventories held by DOE and private utilities have been depleted, see Appendix 4, expanded uranium production will be required to meet demand by the mid 1990s.

C. EPA inappropriately appears to apply outdated federal water quality criteria for selenium to this unique circumstance.

The administrative record in this action shows that EPA applied its own § 304(a) criteria for selenium as the "applicable standard" which Quivira's discharge would be expected to meet under an individual control strategy. However, EPA's attempted application of possibly outdated federal standards neither reflects changing scientific opinion on selenium's toxicity, nor takes into account the unique situation in which Quivira finds itself.

The EPA's national water quality guidelines for selenium were established in 1972. Since that time, a number of scientists have stated that the EPA's criteria are lower and thus stricter than necessary to protect human and animal health. While the EPA's guidelines indicate that selenium in irrigation water should not exceed 0.01 mg/l, and that water for animal consumption should not contain selenium in concentrations greater than 0.05 mg/l, numerous studies and reports by other preeminent individuals and institutes in the field of selenium toxicity have indicated that even concentrations of 0.20 mg/l do not pose serious risks to human and animal health.¹

¹ For example, Dr. G. Schrauzer, Ph.D., University of California, in testimony before the New Mexico Environmental Improvement Board (NMEIB), stated that his research and that of others indicated that humans could safely consume drinking waters containing selenium levels of 0.25 mg/l. See Schrauzer, G. "Selenium, Concerning the Current Groundwater Regulations," presented before the New Mexico Water Quality Control Commission, September 1979. Dr. R. Schamberger, Ph.D., of the Cleveland Clinic Foundation, in the same presentation for the NMEIB, concurred that a 0.25 mg/l concentration would be acceptable. See Schamberger, R., "The Proposed 0.01 mg/liter Standard for Selenium in Groundwater," presented before the New Mexico Water Quality Control Commission, September 1979.

Other researchers and scientists have stated that they believe EPA has set excessively low selenium concentration limits for water. For example, the National Academy of Science has estimated adequate and safe drinking water levels of selenium for adults at 0.05 to 0.20 mg/l.² Reasonable amounts of selenium in humans are recognized as desirable and important for good health. The Academy study goes on to state "that most evidence indicates that there is a greater overall potential for selenium deficiency than for selenium toxicity at current levels of selenium intake." The report further states that the "no observed adverse health effect level for selenium in water is at least 100 ug/l [0.10 mg/l] and appears to be as great as 500 ug/l [0.50 mg/l]."³ Even the EPA's own Science Advisory Board, upon examination of all available studies and information, recommended a drinking water equivalent standard of 0.16 mg/l.⁴

The EPA itself has acknowledged that its earlier selenium water quality guidelines may have been too restrictive, as evidenced by its recent proposal to adjust its national primary and secondary drinking water regulations for selenium. In this proposal, the EPA indicated its intent to raise the selenium drinking water standard from the current 0.01 mg/l to 0.05 mg/l, a five-fold increase,⁵ an acknowledgment that selenium is not toxic to humans even at the increased level. Given the fact that most researchers consider man to be the species most sensitive to toxic pollutants, it is reasonable to assume that the water quality standards for irrigation and livestock may also be in need of upward adjustment and probably by at least the same percentage increase that EPA proposes for humans.

At a minimum, the EPA should move cautiously towards imposing possibly outdated national water quality criteria on New Mexico and Quivira in the context of this § 304(l) proceeding. The EPA's Guidance to § 304(l) recognizes that "EPA and the states should continue to implement a progressive program of toxic pollutant load reduction, focusing first on high priority areas where improvements will result in the greatest environmental benefit." See "Final Guidance for Implementation of Requirements Under Section 304(l) of the Clean Water Act, as amended," March

² EPA, "National Primary and Secondary Drinking Water Regulations; Proposed Rule," 54 Fed. Reg. 22,105.

³ EPA, "Drinking Water and Health Recommendations of the National Academy of Science," 42 Fed. Reg. 35,764.

⁴ EPA, "National Primary and Secondary Drinking Water Regulations; Proposed Rule," 54 Fed. Reg. 22,105.

⁵ EPA, "National Primary and Secondary Drinking Water Regulations; Proposed Rule," 54 Fed. Reg. 22,105.

1988, page 6. The Guidance at Page three also states that "EPA's goal is to insure a reasonable degree of national consistency in addressing problems while preserving sufficient flexibility to construct situations to deal with specific problems." In light of the questions about the appropriateness and possible permanence of EPA's selenium guidelines, EPA should exercise that flexibility in this case. Certainly, given the extraordinarily high natural background loading of selenium in the Ambrosia Lake district, and especially in the Poison Canyon area, as well as the other unique circumstances described herein, it is certainly questionable as to whether there would be any great environmental benefit to imposing an individual control strategy on Quivira's discharge.

This problem, if it exists at all in Quivira's situation, should be addressed as a low priority, considering the other much higher priorities, particularly in the cities and in waters much more seriously affected than the Dry Arroyo/Arroyo Del Puerto in this relatively remote area of New Mexico.

- D. Not only will the EPA's proposed action probably not further the statutory goal of achieving applicable water quality standards for the Arroyo del Puerto, but it does not even meet the requirement of § 304(l) that only waters whose quality is impaired entirely or substantially due to the point source addition of a toxic pollutant should be placed on the § 304(l)(1)(B) short list.

1. Background

Quivira owns an uranium mining and milling facility in the heart of the Grants Mineral Belt, within the Ambrosia Lake mining district in Western New Mexico. This 40 mile wide, highly mineralized belt stretches approximately 110 miles from Albuquerque to the Arizona/New Mexico border. A map and photograph are attached as Appendix 5. Due to depressed market conditions within the uranium industry, the facility is currently operated on a standby status. In this operating mode, Quivira is extracting a small quantity of uranium from the mine water through an ion exchange process. The facility is currently operating at a loss, however, and is being maintained primarily to prevent permanent loss of the mines, with the hope and expectation that the uranium market will improve during the mid 1990s. Quivira discharges excess mine water which naturally contains selenium to an otherwise dry arroyo leading to the Arroyo del Puerto to prevent the mine from permanently flooding.

The Ambrosia Lake mining district's mineralization includes substantial quantities of selenium. As a result, a significant contribution of selenium to surface waters appears to occur as a matter of course within the district from natural background

loading. The native selenium presence in the district and adjacent areas has been extensively documented by various governmental and public agencies including the U.S. Geologic Survey, New Mexico Bureau of Mines and Minerals, and the University of New Mexico. Quivira's own studies of soil along drainages flowing into the Arroyo del Puerto show that natural selenium concentrations in the area are, on average, 2,600 times higher than the average crustal concentration. See Appendix 6. Surface water samples taken by the NMEID from runoff in ephemeral streams in a nearby and geologically similar area, show selenium content as high as 147 micrograms/liter, nearly three times the EPA's water quality criteria for livestock, and seven and a half times the EPA's criteria for irrigation. See Appendix 7.

The water being discharged from the Ambrosia Lake facility meets all of Quivira's current NPDES permit requirements. It is not used as a source of drinking water, nor is it a significant potential surface water source. The discharge flows approximately 1.5 miles before being absorbed into alluvial material. The very limited quantity of water recoverable from the alluvium precludes any significant future use.

Despite intensive research undertaken in the short time since it received notice of the EPA's proposed action, Quivira has not been able to identify any technology which would enable it to meet applicable selenium water quality criteria for livestock or irrigation. Appendix 8 contains a discussion of the investigation undertaken by Quivira on this topic. Even if such technology were available, Quivira's preliminary studies indicate that it would have no economically feasible way of operating with what will certainly be very significant costs associated with any possible water treatment to remove the selenium.

2. Naturally occurring selenium in ground and surface waters and associated mineral deposits (a) make the statutory goal of achieving applicable water quality standards for the Arroyo del Puerto highly questionable, even if an individual control strategy is imposed on Quivira; and (b) based on available evidence would prevent Quivira's discharges from being a substantial cause of the Arroyo's alleged failure to meet applicable water quality standards for selenium.

Section 304(1)(C) and (D) required states to identify facilities which were impairing navigable waters by the introduction of toxic pollutants from point sources, and to create individual control strategies for those point sources to achieve applicable water quality standards. Under § 304(1)(1)(D), each state had to submit to EPA

for each such [impaired] segment, an individual control strategy which the State determines will produce a reduction in the discharge of toxic pollutants from point sources identified by the State under this paragraph through the establishment of effluent limitations under section 402 of this Act and water quality standards under section 303(c)(2)(B) of this Act, which reduction is sufficient, in combination with existing controls on point and nonpoint sources of pollution, to achieve the applicable water quality standard as soon as possible....

(emphasis added)

EPA recognized in the preamble to its Final Rule action on § 304(l) regulations that Congress was making an implicit assumption about the effectiveness of this strategy in achieving water quality standards:

In order for such point source controls, in combination with 'existing nonpoint source controls,' to effectively achieve water quality standards, there is an implicit assumption that such waters are capable of achieving or making significant progress toward achieving water quality standards primarily by controlling point sources of sections 307(a) toxic pollutants.

54 Fed. Reg. 23,868, 23,881 (1989). In this case, however, this implicit assumption may well be inapplicable, and imposing an individual control strategy on Quivira's Ambrosia Lake facility may be a futile endeavor.

Rainfall throughout the Ambrosia Lake and Poison Canyon districts contacts mineralized rock in the area inevitably becomes loaded with selenium. This loading is not a nonpoint source of pollution that could be addressed under a § 319 management program. See 33 U.S.C. § 1329. Because the selenium is native to the districts, current EPA numerical water quality standards for selenium may well never be met for any attainable uses of permanent or ephemeral waterways in the area.

Surely in these circumstances, Congress would not have intended that a point source in a highly mineralized region, discharging waters with naturally high levels of selenium, be subject to an expensive, difficult and uncertain control effort which would be virtually certain not to achieve its goals.

Section 304(l)(1)(B) of the Clean Water Act required New Mexico to submit to the EPA:

a list of all navigable water in such State for which the State does not expect the applicable standard under Section 303 of this Act will be achieved after the requirements of sections 301(b), 306, and 307(b) are met, due entirely or substantially to discharges from point sources of any toxic pollutants listed pursuant to Section 307(a).

In light of the studies cited in Appendices 6 and 7 showing a high natural background of selenium in runoff in the district, it cannot be said that Quivira's Ambrosia Lake facility substantially or entirely causes the Arroyo del Puerto's alleged failure to meet applicable water quality standards for selenium. Therefore, under the plain language of the statute, Quivira's Ambrosia Lake facility does not belong on the (C) list.

EPA has failed to recognize the serious problem of background loading of natural selenium in this case. Quivira believes that the EPA should take this natural background loading into account and reverse its preliminary decision or proposal to add Quivira's Ambrosia Lake facility to the (C) list for individual control strategy treatment. A further discussion of the need to consider natural background loading in the context of § 304(l) is attached as Appendix 9.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202-2733

P.E.

April 12, 1990

Ms. Kathleen Sisneros
Chief, Surface Water Quality Bureau
New Mexico Environmental
Improvement Division
1190 St. Francis Drive
Santa Fe, New Mexico 87503

RECEIVED
APR 13 1990
SURFACE WATER
QUALITY BUREAU

Dear Ms. Sisneros:

By this letter, the Region is transmitting additions to the June 3, 1990, 304(1) listing decisions proposed for your State. These additions do not pertain to petitions received during the initial comment period, therefore additional review by the public is sought.

The Region will solicit comments on these additions during a public comment period beginning April 14, 1990, and expiring May 14, 1990. During this period, any person, including the State, may comment on these additional decisions and offer information about the listed waters and dischargers. Following the close of this comment period and after careful consideration of all comments received during this period and the initial comment period on the 304(1) proposed decisions, the Region will make its final decisions on the 304(1) lists. This action will be taken on or before June 4, 1990.

If you have any questions about the Region's additions, please call me at (214) 655-7100, or ask your staff to contact Eve Boss, the regional 304(1) coordinator, at (214) 655-7145.

Sincerely yours,

Myron O. Khudson

Myron O. Khudson, P.E.
Director
Water Management Division (6W)

Enclosure

cc: Mr. Richard Mitzelfelt, Director

APPENDIX 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

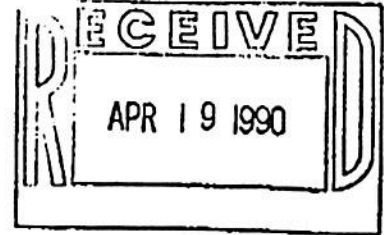
REGION 6

1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202-2733

April 13, 1990

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (P 057 307 352)

REPLY TO: 6W-PT



Mr. Art Gebeau, General Manager
Quivira Mining Company
P.O. Box 218
Grants, New Mexico 87020

Dear Mr. Gebeau:

This letter is to inform you that, in accordance with 40 CFR 130.10(d)(10), as promulgated on May 26, 1989, the U.S. Environmental Protection Agency, Region 6, has made an proposed decision to add to the list submitted by the State of New Mexico as required by section 304(1)(1)(C) of the Clean Water Act. Your facility is now being considered for inclusion on this list.

Please find enclosed a copy of the Region's proposed decision and explanation of the 304(1) process. There will be a 30 day comment period on this proposed decision which begins on April 14, 1990, and extends to May 14, 1990. The Region will make a final decision on this list [304(1)(1)(C)] in accordance with 40 CFR 130.10(d)(11).

The Region is willing to meet with you in April to discuss this proposed action. If you have any questions about the 304(1) process or would like to schedule a meeting with the Region in Dallas, please contact Michael Morton of my staff at (214) 655-7175.

Sincerely yours,

Myron O. Knudson, P.E.
Director
Water Management Division (6W)

Enclosure

cc: New Mexico Health and Environmental Department

RODEY, DICKASON, SLOAN, AKIN & ROBB, P. A.

COUNSELLORS AND ATTORNEYS AT LAW
20 FIRST PLAZA, SUITE 700
P. O. BOX 1888
ALBUQUERQUE, NEW MEXICO 87103

TELEPHONE (505) 765-5900

FACSIMILE (505) 768-7395

May 11, 1990

OF COUNSEL
DON L. DICKASON
WILLIAM A. SLOAN
JACKSON G. AKIN
RAY H. RODEY

PEARCE C. RODEY (1889-1958)

SANTA FE OFFICE:
MARCY PLAZA, SUITE 101
123 EAST MARCY STREET
P. O. BOX 1357
SANTA FE, NM 87504-1357
TELEPHONE 984-0100
AREA CODE 505
FACSIMILE 989-9542

WRITER'S DIRECT NUMBER

JOHN D. ROBB
JAMES C. RITCHIE
WILLIAM C. SCHAB
ROBERT M. ST. JOHN
JOSEPH J. MULLINS
DUANE C. GILKEY
MARK K. ADAMS
ROBERT G. MCCORKLE
PETER G. PRINA
BRUCE HALL
JOHN P. SALAZAR
WILLIAM S. DIXON
JOHN P. BURTON
REX D. THROCKMORTON
JONATHAN W. HEWES
GENE C. WALTON
RICHARD C. MINZNER
W. ROBERT LASATER, JR.
MARK C. MEIERING
VICTOR R. MARSHALL
PAUL D. BARBER
CATHERINE T. GOLDBERG
PAUL A. COOTER
TRAVIS R. COLLIER
JO SAXTON BRAYER
S. I. BETZER, JR.
EDWARD RICCO
W. MARK MOWERY
PATRICK M. SHAY
NANCY J. APPLEBY
WAYNE G. CHEW
DAVID C. DAVENPORT, JR.

DEBRA ROMERO THAL
ELLEN G. THORNE
JAMES O. BROWNING
TRACY E. MCGEE
CHARLES E. STUCKEY
HENRY M. BOHNHOFF
MICHAEL J. CONDON
CHARLES K. PURCELL
JAMES P. FITZGERALD
ANDREW G. SCHULTZ
JOHN M. BRANT
NEAL W. HARDIN
JOSEPH B. ROCHELLE
SCOTT D. GORDON
SUSAN L. SNYDER
JOEL K. JACOBSEN
ANGELA M. MARTINEZ
PATRICIA M. TAYLOR
ODGEN M. REID
BRIAN H. LEMATTA
MARK A. SMITH
R. NELSON FRANSE
THURMAN W. MOORE III
STEVEN G. KOPELMAN
PAUL R. KOLLER
JOY READ
JAMES P. BIEG
JAY B. SIMONSON
JAY D. HILL
CHARLES J. VIGIL
MARY P. KELEHER
JAMES E. BURKE

Failure of EPA to comply with deadlines and comment periods
under §304(1) of the Clean Water Act, 33 U.S.C. §1314(1)
and EPA regulations.

Facts

In January 1989, the State of New Mexico, complying with §304(1) of the Clean Water Act, 33 U.S.C. § 1314(1), submitted three lists of waters to the EPA. The first list, pursuant to §304(1)(1)(A)(i), included those waters within the state which were not expected to achieve certain water quality standards, after technology-based requirements were met, because of the presence of §307(a) "toxic pollutants," 33 U.S.C. § 1317, including selenium. Included on this so-called "mini" list was the Dry Arroyo/Arroyo Del Puerto into which the Quivira Mining Company discharges naturally-selenium bearing mine process waters pursuant to its NPDES permit.

The second, so-called "long" list submitted by the State to the EPA, under §304(1)(1)(A)(ii), also included the Dry Arroyo/Arroyo Del Puerto. The second list included among other things all waters within the State which did not, after application of technology-based limits, meet water quality standards due to any conventional, nonconventional, or toxic pollutant, and any waters which were classified for uses which did not meet the "fishable" or "swimmable" goals of the Clean Water Act.

In explaining its methodology to the EPA, New Mexico prepared its third list in the form of drafts and a full discussion of candidates for inclusion on its final submission of a third or "short" list provided for under §304(1)(1)(B). However, it included no entries on its submitted third list. This third list would have included all navigable waters in New Mexico, which, due entirely or substantially to point source discharges of toxic pollutants (as defined in §307(a)), the State did not expect would meet applicable water quality standards under §303 of the Clean Water

APPENDIX 2

Act, even after application of the best available pollution control technology, and pretreatment and new sources performance standards. Had New Mexico included any waters on the third, so-called (B) or "short" list submitted to the EPA, the State would have been required to enter on a fourth, so-called "(C)" list, pursuant to §304(1)(1)(C), the specific point sources of the toxic pollutants impairing the quality of the waters described on the short list, together with the amounts of toxic pollutants discharged by each such source.

As stated, New Mexico did not include any waters or point sources on the short or (C) lists, and in particular did not include the Dry Arroyo/Arroyo Del Puerto and/or Quivira Mining Company, because the State determined that they did not meet the criteria for the short and (C) lists, and therefore did not belong on them.

Pursuant to EPA regulations, on June 4, 1989 the Regional Administrator of Region 6 of the EPA approved the State's decision to list various waters on the first two lists, including the Dry Arroyo/Arroyo Del Puerto. The EPA did not disapprove of the State's decision not to submit any waters or point sources or the short or (C) lists, except for the State's decision to omit the Rio Grande River below Las Cruces as a water on the short list. It also disapproved the State's decision not to list the City of Las Cruces on the (C) list as the point source of the toxic pollutants in the Rio Grande below the city.

EPA Region 6 published notice of its action and solicited comments from the public on the Region's decisions to approve or disapprove the lists submitted by the State of New Mexico. The deadline for submitting comments was set, by regulation, as October 4, 1989, 120 days after the date of EPA's notice of approvals and disapprovals.

The record discloses that no person submitted a comment or petition referring to or suggesting the inclusion of Dry Arroyo/Arroyo Del Puerto or Quivira Mining Company on the short or (C) lists.

On April 12 and 13, 1990 EPA Region 6 sent letters to NMEID and Quivira, respectively, enclosing a notice dated April 14, 1990, which, for the first time, indicated that it disapproved of the State's decision not to add the Dry Arroyo/Arroyo Del Puerto and the Quivira Mining Company to the short and (C) lists. No reasons for the proposed action were given. The EPA also allegedly published a notice in which it solicited comments on these proposed additions, to be received on or before May 14, 1990. The EPA indicated that it would make its final decision on the lists following the close of the comment period. The State of New Mexico, Environmental Improvement Division did not receive

the letter and notice until April 18, 1990, and Quivira, not until April 19, 1990.

As of May 7, 1990, (when it was inspected for the first time by Quivira), the brief administrative record indicates that EPA's proposed action is based upon reports of Quivira discharges between July 1, 1989 and October 1, 1989 allegedly in violation of applicable water quality standards. These reports were ordered by EPA on June 27, 1989 and received by EPA between June 27, 1989 and October 25, 1989.

Question Presented

Did the EPA's April 14, 1990, proposed action and notice thereof comply with the pertinent statute and EPA's own regulations?

Answer

No. EPA's proposed actions and the notice were untimely and violated both the statute and its own regulations.

The Law

A. The Act

Section 304(1) of the Clean Water Act established a comprehensive program to control toxic pollutants. By February 4, 1989, two years from its effective date of February 4, 1987, each state was required to submit to the EPA lists of impaired waters, and point sources contributing to that impairment, as described in the Facts section above. If a state identified waters which were properly categorized in the (B) or short list, and could determine and include on the (C) list the specific point sources of toxic pollutants creating those impairments, then the state was responsible for developing "individual control strategies" for each specific point source. These individual control strategies had to be designed to reduce the discharge of toxic pollutants from the point sources identified on the (C) list to achieve applicable water quality standards, no later than three years after the individual control strategy was established. The individual control strategies were to be implemented by the establishment of effluent limitations under NPDES permits for each point source, and by the application of water quality standards.

Section 304(1)(2), 33 U.S.C. § 1314(1)(2) required the EPA to approve or disapprove individual control strategies submitted by the states no later than June 4, 1989.

B. The Regulations

The regulations EPA promulgated under § 304(1) required that each state submit the four lists of §304(1) no later than February 4, 1989. 40 C.F.R. § 130.10(d)(1)-(3). Paragraph (d)(8) required the Regional Administrator to approve or disapprove each state's lists not later than June 4, 1989. Paragraph (d)(10) stated that if the Regional Administrator disapproved a state's decision with respect to listing a state water under one of the three lists, mini, long or short, then the Regional Administrator would issue its notice of approval or disapproval not later than June 4, 1989. The Regional Administrator was also required to publish a notice of availability for the notice of approval or disapproval, seeking public comment on the notice to be received within 120 days, or by October 4, 1989.

Paragraph (d)(11) provided that as soon as practicable but not later than June 4, 1990, the Regional Office of the EPA would issue a response to any petitions or comments received under paragraph (d)(10) of the regulations. Notice of the response to the comment was to be given in the same manner as provided for in paragraph (d)(10), except that the lists of waters, point sources and pollutants had to reflect any changes made pursuant to comments or petitions received.

C. EPA Was Required to Approve or Disapprove of the State's Lists By June 4, 1989

EPA is not empowered, after the June 4, 1989 deadline, to approve or disapprove lists submitted by a state, or to make changes or additions thereto, except in the specific context of responding to a public comment made during the 120-day comment period. No such comments were made. Even then, paragraph (d)(11) requires that the (d)(10) 120-day period for comment apply to any notice of proposed changes, meaning EPA's last day for giving proper notice was February 4, 1990.

EPA has no authority to submit an "initial" notice of approval or disapproval and then to "supplement" such a notice, as EPA has stated it is doing. The statute and regulations simply say that approval or disapproval of lists submitted by a state must be made by June 4, 1989. EPA understands its obligations in this respect, since it complied with that deadline in timely disapproving the State's decision not to add the lower Rio Grande and the city of Las Cruces to the (B) and (C) lists, in the EPA's June 4, 1989 notice of approvals and disapprovals.

Neither §304(1)(3) of the Act nor 40 C.F.R. § 130.10(d)(9) extend the deadline for adding to the state's lists as EPA has attempted to do in this case. That section of the Act relates solely to EPA's developing individual control strategies under certain

circumstances before June 4, 1990, not to lists. And (d)(9), which gives the Regional Administrator an additional year to act, applies only in two circumstances: 1) when the state has failed to submit lists - not when it simply decides not to include certain waters on those lists and informs EPA of its decision, which is the situation here; and 2) when the EPA Regional Administrator disapproves a state's decision with respect to one or more waters on or before June 4, 1989, then the Regional Administrator is given an additional year to develop an individual control strategy for the point sources added by the EPA on June 41, 1989, which is also not the situation here.

D. EPA has Failed to Provide the Required 120-Day Notice

Even if EPA could reserve its time to approve or disapprove the State's lists beyond June 4, 1989 its failure to follow its own required notice and comment regulations is a serious and fatal omission. It is an outright violation of the regulation's "due process" protection afforded to the State and Quivira. EPA has not provided the State or Quivira with an adequate amount of notice and time to respond with comments to its proposed action. 40 C.F.R. § 130.10(d)(10)(vi) provides for a 120-day comment period. In its supplemental proposed action, EPA purports to give notice under § 130.10(d)(10) but only allows 30, not 120 days, to comment. This drastically shortened notice period renders EPA's proposed action invalid as a matter of law.

E. Cases

Failures by the EPA and other federal agencies to comply with similar notice and comment provisions, or other types of regulations involving both quasi-judicial and rule making agency action, have resulted in the action being struck down as invalid and unenforceable by the courts in various similar situations referred to below. Thus in Natural Resources Defense Council, Inc. ("NRDC") v. EPA, 683 F.2d 752 (3d Cir. 1982) and National Association of Metal Finishers v. EPA, 719 F.2d 624 (3d Cir. 1983), rev'd on other grounds, 470 U.S. 116 (1985), the Court of Appeals declared void and unenforceable the EPA's promulgation of certain proposed rules and definitions which were made without complying properly with notice and comment requirements.

In NRDC and in a number of other cases (see, e.g., American Federation of Government Employees v. Block, 655 F.2d 1153 (D.C. Cir 1981), United States courts of appeal have specifically held that the approach of an EPA deadline was not an excuse for failing to provide the required notice and comment, particularly where EPA could have complied with such notice and comment requirements at an earlier time. Thus, the mere existence of EPA's June 4, 1990 asserted deadline provides no excuse for its failure to comply in the instant case, since EPA could have

complied with the 120-day requirement long before April of 1990. This is shown by the fact that the NPDES file in the EPA's regional office in Dallas contains reports of allegedly excessive selenium discharges from Quivira's Ambrosia Lake facility (e.g., above the applicable water quality standard relied upon by EPA herein) for substantial periods prior to June 4th of 1989.

A right of the public to comment and to participate in hearings was held to be violated in adjudicatory agency proceedings in National Wildlife Federation v. Marsh, 568 F. Supp. 985 (D.D.C. 1983) and Friends of the Earth v. Hall, 693 F. Supp. 904 (W.D. Wash. 1988) where the agency failed to insert the rationale for and important data respecting its proposed decision into the administrative record until after the comment period expired. See also New Jersey v. EPA, 626 F.2d 1038 (D.C. Cir. 1980). Moreover, it has been held that the failure by the Army Corps of Engineers to conduct the required adequate consultation with the U.S. Fish and Wildlife Service on an administrative matter invalidated the Corps' action in Reid v. Marsh, 20 Env't Rep. Cas. (BNA) 1337 (N.D. Ohio Jan. 4, 1984).

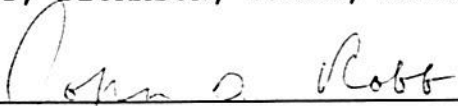
Thus the failure of EPA (a) to act to disapprove or approve the State's lists within the 120-day period between February 4, 1989 and June 4, 1989, and (b) to provide a 120-day notice and comment period, on its late-proposed action effectively denied the public, the State of New Mexico and Quivira their right to effectively participate in the §304(l) process in developing lists and individual control strategies. This was the withholding of a much more substantial right than the mere "consultation" role of the U.S. Fish and Wildlife Services in the Reid case.

Other courts have frequently held that such actions by various federal agencies are void and invalid as applied to groups or individuals which were not furnished with proper notice and opportunity to comment, as provided by the federal Administrative Procedure Act, where the objections were not as to insignificant matters and where they had a substantive impact upon the affected parties. See Reynolds Metal Co. v. Rumsfeld, 417 F. Supp. 365 (D. Va. 1976), aff'd in part and rev'd in part, 564 F.2d 663 (4th Cir. 1977), cert. denied, 435 U.S. 995 (1978), McDonnell Douglas Corp. v. Marshall, 465 F. Supp. 22 (E.D. Mo. 1978) A. O. Smith Corp. v. Marshall, 396 F. Supp. 1108 (D. Del 1975), aff'd in part and vacated in part on other grounds, 530 F.2d 515 (3d Cir. 1976); City of New York v. Diamond, 379 F. Supp. 503 (S.D.N.Y. 1974); United States v. Daniels, 418 F. Supp. 1074 (D.S.D. 1976); Environmental Defense Fund Inc. v. Gorsuch, 713 F.2d 802 (D.C. Cir. 1983).

RODEY, DICKASON, SLOAN, AKIN & ROBB, P. A.

RODEY, DICKASON, SLOAN, AKIN & ROBB, P.A.

By


John D. Robb

Post Office Box 1888

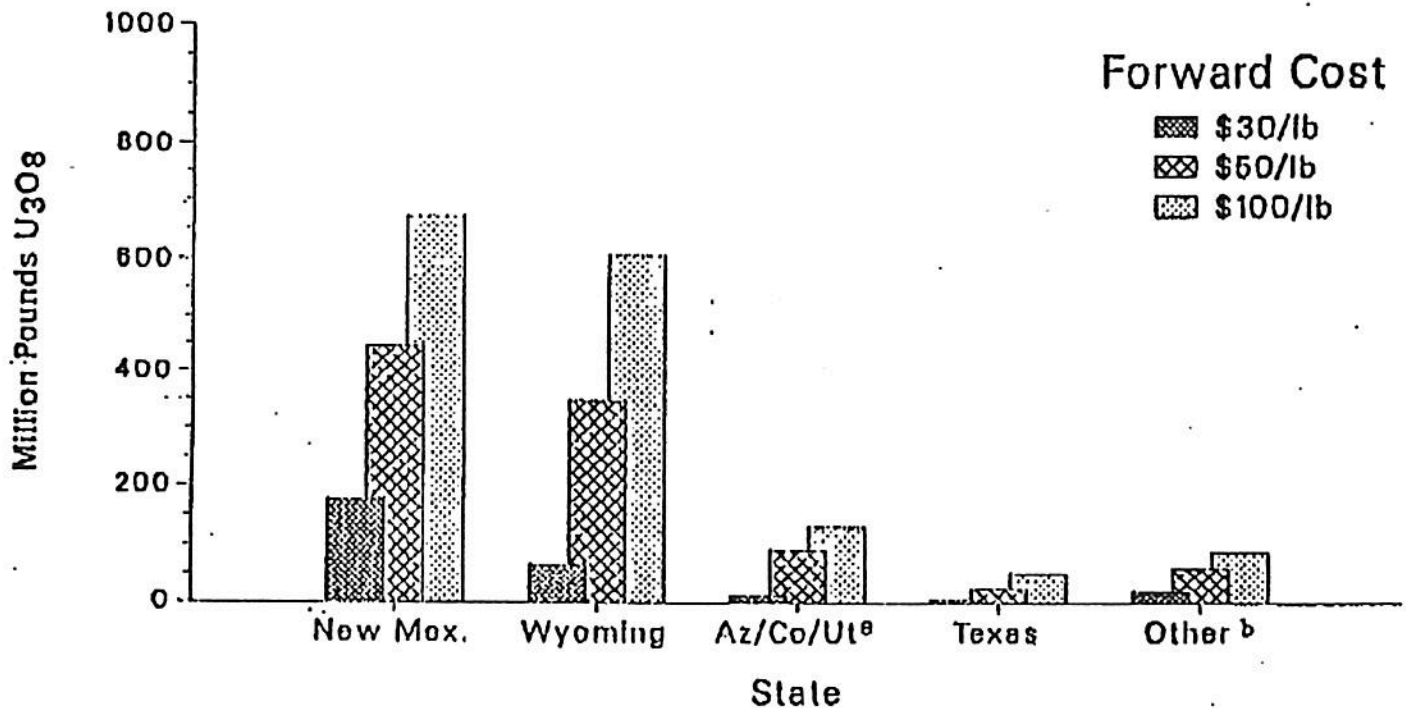
Albuquerque, New Mexico 87103

Telephone: (505) 765-5900

1. In light of the natural origin of the selenium in Quivira's discharge, does it violate applicable water quality standards?
2. Is there an adequate administrative record supporting the EPA's water quality standards for selenium, which it promulgated pursuant to § 304 of the Act, 33 U.S.C. § 1314, and/or are the standards outdated?
3. Are there more studies and secondary materials which would support Quivira's argument that natural background loading of selenium, and not the Ambrosia Lake facility's discharges, are the substantial cause of the Arroyo del Puerto's alleged inability to meet applicable water quality standards?
4. Has the EPA adequately considered the relationship between natural background loading and the State's water quality standards for the arroyo, in relationship to the issues raised under this § 304(1) proceeding?
5. Are variances available under the circumstances of this action?
6. Does the EPA have the authority to use its numeric water criteria guidelines in place of state narrative water quality criteria in the § 304(1) process?
7. Was EPA required to state the reasons for its recommendations in the April 14, 1990 Notice?
8. Did EPA convert what Congress intended in § 304(1) as primarily or at least critically a state process into a federal one?
9. Did EPA adequately follow the directions and purposes of § 304(1), both in carrying out the program and in this case?

APPENDIX 3

Reasonably Assured Resources by State at the End of 1988



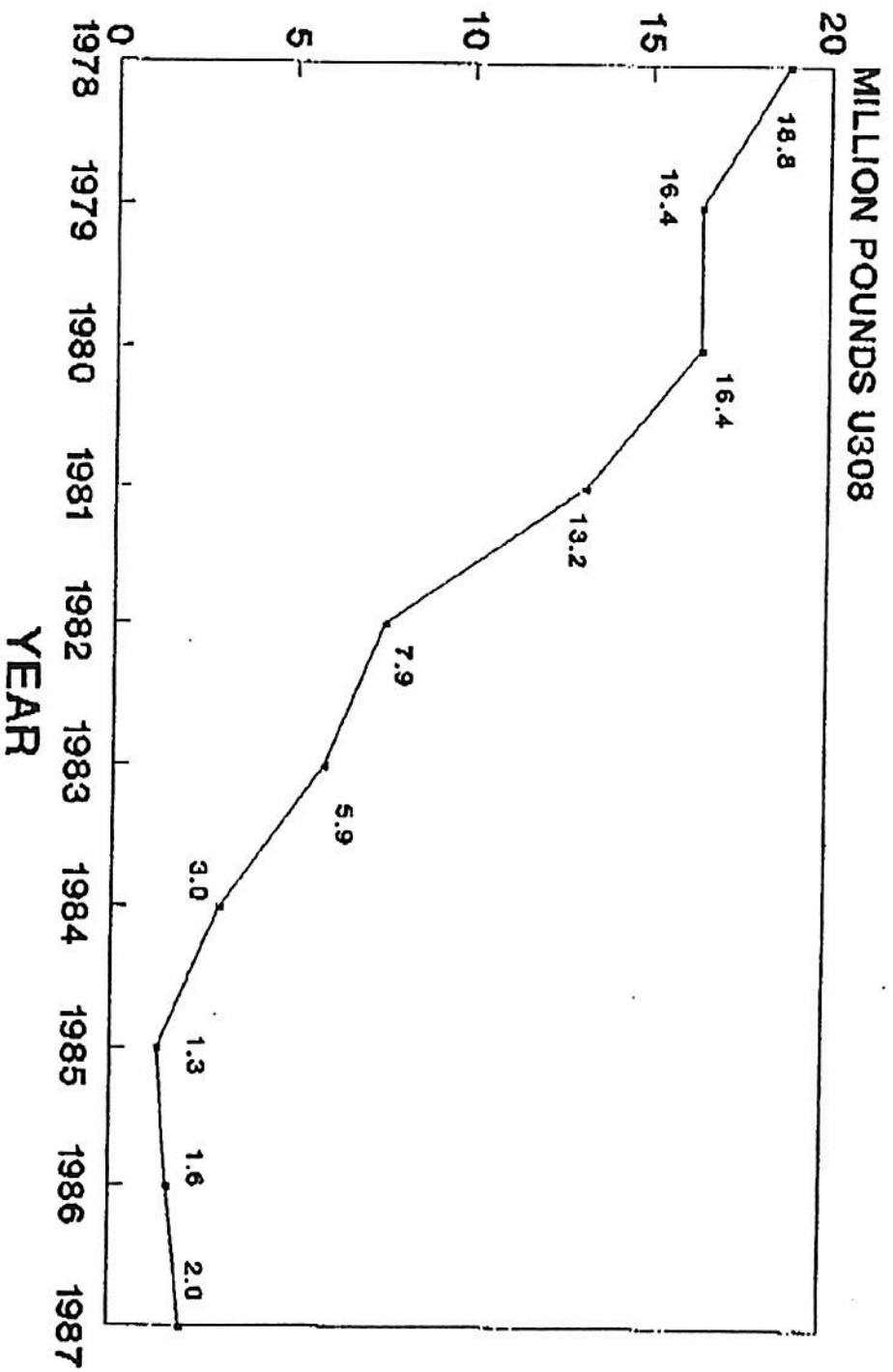
^aArizona, Colorado, and Utah.
^bOther includes California, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

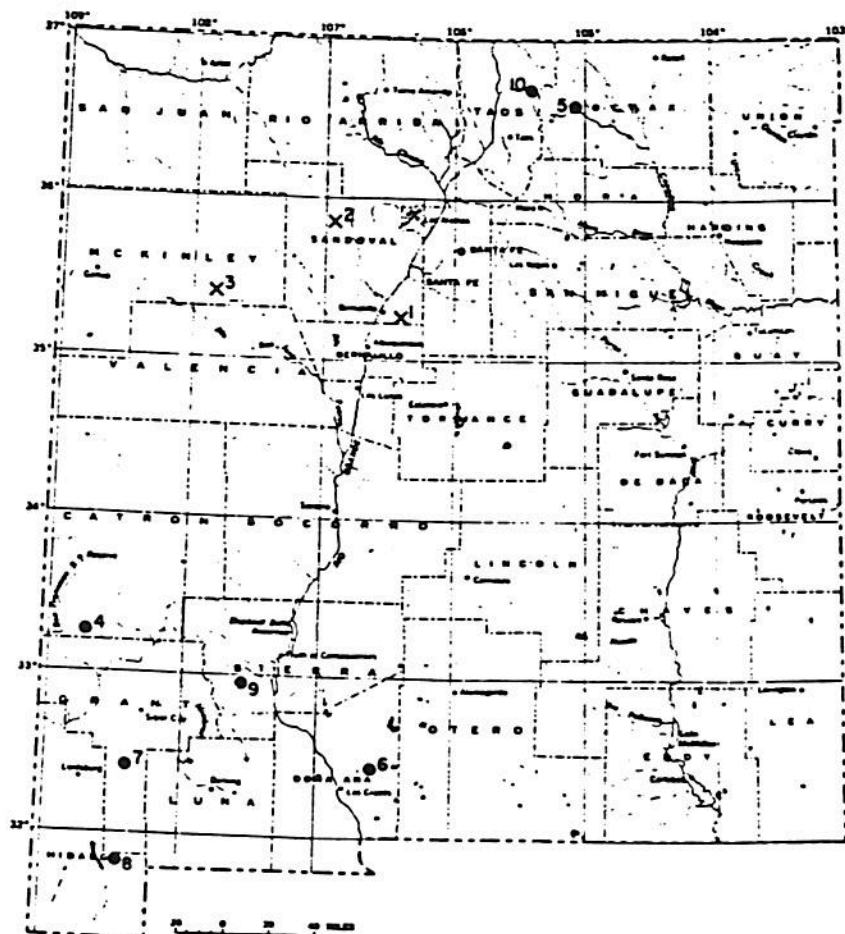
Reasonably Assured Resources by State and Mining Method at the End of 1988 (Million Pounds U₃O₈)

Item	Forward-Cost Category in Nominal Dollars		
	\$30 per pound	\$50 per pound	\$100 per pound
State			
New Mexico	177	447	673
Wyoming	68	340	608
Texas	8	20	65
Arizona, Colorado, Utah	14	04	133
Others ^a	22	04	93
Total	209	801	1,560

^a Includes California, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

MINE PRODUCTION OF URANIUM New Mexico

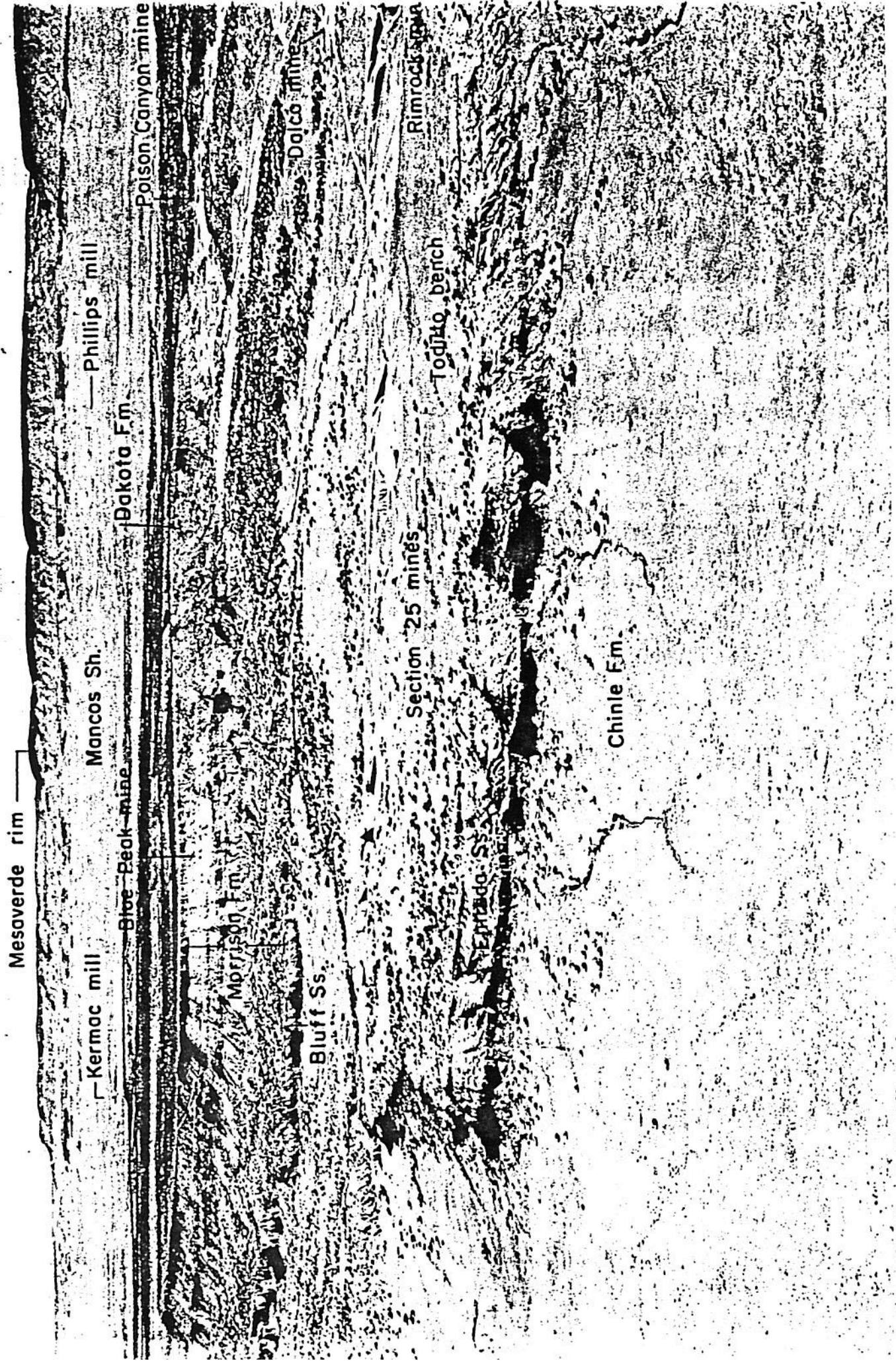




EXPLANATION

- | | |
|---------------------------|-----------------------------------|
| X | ● |
| Selenium occurrences | Tellurium occurrences |
| 1. Nagan district | 4. Wilcox district |
| 2. La Ventana district | 5. Ute Creek district |
| 3. Ambrosia Lake district | 6. Organ district |
| | 7. Little Burro Mountain district |
| | 8. Sylvanite district |
| | 9. Millsboro district |
| | 10. Red River district |

FIGURE 48.—Selenium and tellurium in New Mexico.



Air view north of the Ambrosia Lake area showing some of the principal mines and mills and the northwest-dipping stratigraphy from the Upper Triassic Chinle Formation in the foreground to the Upper Cretaceous Hosta Sandstone Member of the Mesaverde Group on the skyline.

Pueblo Photo Service photo.

The U.S. Geologic Survey in a report on the Grants Mineral Belt states: "Uranium deposits occur along the outcrops of these beds in McKinley and Valencia Counties for a distance of 18 miles ... of Grants." The report goes on to state, "The deposit studied is in Poison Canyon, 14 miles northeast of Grants, ... A selected sample of black carbonaceous ore contained 2.02 percent equivalent U, ... and 0.234 percent Se [selenium]. As far as the writer knows, this is the largest amount of selenium reported from a sedimentary rock."¹ (Emphasis added).

Selenium has been found to occur in 2,340 ppm naturally in rocks in the area, as compared to the average crustal amount of 0.05 ppm selenium. In a later U.S. Geologic Survey report, values of up to 4,100 ppm selenium were found in outcrops in the Todilto Limestone.²

The first U.S. Geologic Survey report goes on to state: "Carbonaceous uranium ore in the Morrison formation contains a high percentage of selenium, and selenium-indicator plants are commonly associated with these deposits. The occurrence of selenium-indicating Astragalus plants on the Westwater Canyon sandstone member of the Morrison formation at Poison Canyon ... is a feasible method of prospecting for uranium. Areas of plants occurring on alluvium and along appropriate stream drainage as well as areas of plants closely associated with the outcrop of the ore-bearing beds should be investigated."³ (Emphasis added).

A study performed by the New Mexico Institute of Mining and Technology in 1984, stated, in summary, "Trace metals As, Se [selenium], Cd, Hg, and U show elevated values on a regional basis but not correlation with age (i.e., pre- or post-1950). These elevated trace metal values may simply be due to their

¹ U.S. Geologic Survey, "Geobotanical Reconnaissance Near Grants, New Mexico," U.S. Department of the Interior, Geologic Survey Circular 264, 1953.

² Coleman, R. and Delevauz, M., "Occurrence of Selenium in Sulfides From Some Sedimentary Rocks of the Western United States," U.S. Geologic Survey, 1957.

³ U.S. Geologic Survey, "Geobotanical Reconnaissance Near Grants, New Mexico," U.S. Department of the Interior, Geologic Survey Circular 264, 1953.

association with the regionally mineralized rocks."⁴ (Emphasis added).

This was substantiated in a report by the NMEID on the natural surface water quality in the Grants Mineral Belt. The report states that due to intense thunderstorms, large volumes of runoff whether, overland or in channels, readily entrain exposed sediment grains. Suspended sediment concentrations averaged 42,000 mg/l. Selenium levels in these natural runoff waters collected ran as high as 147 ug/l.⁵ Selenium concentrations will increase with additional increases of sediment load.⁶

New Mexico Institute of Mining and Technology, in a study of heavy metals in the Grants Mineral Belt, evaluated sediment samples of the Rio San Jose drainage. The selenium concentration in the sediment averaged 0.37 ppm.⁷ Because selenium readily oxidizes in the alkaline soil of the area, they have a greater tendency to readily dissolve making them available for runoff.⁸

In an effort to determine the selenium quantities available for runoff in the Arroyo del Puerto and Poison Canyon area, Quivira recently collected soil samples along the natural drainages flowing into the Arroyo del Puerto. The results indicate a very significant selenium load into the Arroyo del Puerto from natural runoff drainages not associated with Quivira's discharge. The results of the soil samples are shown in Table 1.

⁴ Popp, C.J. et al., "Radionuclide and Heavy Metal Distribution in 20th Century Sediments of Major Streams in the Eastern Part of the Grants Uranium Region, New Mexico," New Mexico Bureau of Mines and Mineral Resources, 1984.

⁵ NMEID, "Natural Surface Water Quality in the Grants Mineral Belt", Selected Papers on Water Quality and Pollution in New Mexico, 1984.

⁶ NMEID, "Natural Surface Water Quality in The Grants Mineral Belt", Selected Papers on Water Quality and Pollution in New Mexico, 1984.

⁷ Popp, C. J. et al, "Radionuclide and Heavy Metal Distribution in 20th Century Sediments of Major Streams in the Eastern Part of the Grants Uranium Region, New Mexico", New Mexico Bureau of Mines and Mineral Resources, 1984.

⁸ NMEID, "Natural Surface Water Quality in The Grants Mineral Belt", Selected Papers on Water Quality and Pollution in New Mexico, 1984.

Table 1
Natural Selenium Levels
In Drainages Flowing Into the Arroyo del Puerto

<u>Location</u> (ppm)									
#1	#2	#3	#4	#5	#6	#7	#7A	#8	#8A
4.1	<0.1	0.2	4.7	2.6	2.4	113	4.1	2.3	0.7

*Note - natural selenium crustal average is 0.005 ppm⁹

The results show that natural selenium concentrations in the area are up to 22,600 times greater than the average crustal concentration. Overall, the average natural selenium within the Ambrosia Lake and Poison Canyon samples are in excess of 2,600 times the average. As can be seen, when combined with water runoff from precipitation events, natural sources can and do cause a "substantial" selenium load to the Arroyo del Puerto system.

⁹ Encyclopedia of Chemical Technology, "Selenium and Selenium Compounds", Wiley and Sons, 1982.

MAY 10 '90 10:17 NM HED/EID
 2STORET RETRIEVAL DATE 90/03/05 PSN=ALLPARN

PP.3 1.

AVAILABLE NEW MEXICO DATA

PROVIDED BY NHEID

/TYPA/AMBNT/STREAM/RUNOFF/NET

GP0101 GMB0057
 35 19 58.0 107 51 04.0 4
 POISON CANYON 1 SINGLE-STAGE RUNOFF SAMPLER
 35031 NEW MEXICO MCKINLEY
 WESTERN GULF 120900
 UPPER RIO GRANDE ABOVE PECOS RIVER
 21NMEX 830326 HQ 13020207
 0000 FEET DEPTH

INITIAL DATE				82/08/25	82/10/06
INITIAL TIME				1430	1716
MEDIUM				WATER	WATER
00095	CONDUCTIVITY	AT 25C	MICROMHO	664	358
00403	PH	LAB	SU		8.2
00530	RESIDUE	TOT NFLT	MG/L	75499	15412
01002	ARSENIC	AS,TOT	UG/L	352	150
01007	BARIUM	BA,TOT	UG/L	9920	9500
01027	CADMIUM	CD,TOT	UG/L	16	6
01051	LEAD	PB,TOT	UG/L	825	516
01062	MOLY	MO,TOT	UG/L	10K	10K
01087	VANADIUM	V,TOT	UG/L	1047	520
01092	ZINC	ZN,TOT	UG/L	1945	860
01147	SELENIUM	SE,TOT	UG/L	34	50
01502	ALPHA-T	ERROR	PC/L	490	200
03501	BETA	TOTAL	PC/L	2660	1300
03502	BETA-T	ERROR	PC/L	470	100
28011	URANIUM	NAT TOT	UG/L	580.0	140.0
80029	ALPHA	TOT AS U	PC/L	2900.0	1400.0

AVAILABLE NEW MEXICO DATA

PROVIDED BY NHEID

/TYPA/AMNT/STREAM/RUNOFF/NET

GP0102 GMS058
 JS 20 06.0 107 51 03.0 4
 POISON CANYON 2 SINGLE-STAGE RUNOFF SAMPLER
 35031 NEW MEXICO MCKINLEY
 WESTERN GULF 120900
 UPPER RIO GRANDE ABOVE PECOS RIVER
 21NMEX 830326 HQ 13020207
 0000 FEET DEPTH

INITIAL DATE			82/08/25	82/10/06
INITIAL TIME			1400	1657
MEDIUM			WATER	WATER
01002	ARSENIC	AS,TOT	UG/L	83
01007	BARIUM	BA,TOT	UG/L	4850
01027	CADMIUM	CD,TOT	UG/L	5
01051	LEAD	PB,TOT	UG/L	342
01062	MOLY	MO,TOT	UG/L	10K
01087	VANADIUM	V,TOT	UG/L	79
01092	ZINC	ZN,TOT	UG/L	1945
01147	SELENIUM	SE,TOT	UG/L	20
01502	ALPHA-T	ERROR	PC/L	110
03501	BETA	TOTAL	PC/L	760
03502	BETA-T	ERROR	PC/L	110
28011	URANIUM	NAT TOT	UG/L	130.0
80029	ALPHA	TOT AS U	PC/L	730.0

AVAILABLE NEW MEXICO DATA

PROVIDED BY NMEID

/TYPA/AMBNT/STREAN/RUNOFF/NET/BACK

GP0103 GMB5059
35 20 39.0 107 52 22.0 4
POISON CANYON 3 SINGLE-STAGE RUNOFF SAMPLER
35031 NEW MEXICO MCKINLEY
WESTERN GULF 120900
UPPER RIO GRANDE ABOVE PECOS RIVER
21NMEX 830326 HQ 13020207
0000 FEET DEPTH

INITIAL DATE			82/08/05	82/08/25	82/10/06
INITIAL TIME			1530	1330	1640
MEDIUM			WATER	WATER	WATER
00095	CONDUCTVY	AT 25C		441	345
00100	TIME OF	TRAVEL	2255.0		
00403	PH	LAB			8.0
00530	RESIDUE	TOT NFLT		939	32037
01002	ARSENIC	AS,TOT	255	47	226
01007	BARIUM	BA,TOT	12000	43500	9100
01027	CADMIUM	CD,TOT	14	48	6
01051	LEAD	PB,TOT	660	1979	436
01062	MOLY	MO,TOT	10K	10K	10K
01087	VANADIUM	V,TOT	790	3180	580
01092	ZINC	ZN,TOT	1520	3890	11000
01147	SELENIUM	SE,TOT	29	147	35
01502	ALPHA-T	ERROR		400	200
03501	BETA	TOTAL		2000	970
03502	BETA-T	ERROR		430	120
09501	RA-226	TOTAL		321.0	6.0
09502	RA-226	ERROR		90.0	2.0
17501	PB-210	TOTAL		720.0	132.0
17502	PB-210	ERROR		100.0	10.0
28011	URANIUM	NAT TOT	210.0	560.0	150.0
80029	ALPHA	TOT AS U		2100.0	1200.0

AVAILABLE NEW MEXICO DATA

PROVIDED BY NMEID

/TYPA/AMBNT/STREAM/RUNOFF/NET/MINE

GP0104 GMB0060
 35 20 22.0 107 49 51.0 4
 POISON CANYON 4 SINGLE-STATION RUNOFF SAMPLER
 35031 NEW MEXICO MCKINLEY
 WESTERN GULF 120900
 UPPER RIO GRANDE ABOVE PECOS RIVER
 21NMEX B30326 HQ 13020207
 0000 FEET DEPTH

INITIAL DATE			82/08/05	82/10/06
INITIAL TIME			1715	1735
MEDIUM			WATER	WATER
00095	CONDUCTVY	AT 25C		517
00403	PH	LAB		8.2
00530	RESIDUE	TOT NFLT		58288
01002	ARSENIC	AS,TOT	128	339
01007	BARIUM	BA,TOT	5570	10400
01027	CADMIUM	CD,TOT	5	9
01051	LEAD	PB,TOT	609	837
01062	MOLY	MO,TOT	1400	530
01087	VANADIUM	V,TOT	2390	3550
01092	ZINC	ZN,TOT	800	1300
01147	SELENIUM	SE,TOT	5K	59
01502	ALPHA-T	ERROR	3000	6000
03501	BETA	TOTAL	11600	14500
03502	BETA-T	ERROR	1000	1500
28011	URANIUM	NAT TOT	8390.0	6850.0
80029	ALPHA	TOT AS U	24200.0	36000.0

Quivira, in the limited time available, has investigated the Best Available Technology (BAT) processes for removal of selenium, including coagulation with filtration, lime softening, reverse osmosis, and activated alumina. Quivira has also researched the possibility of using ion exchange, electrodialysis, and distillation methods.

The results of the investigation show that even the best available technology for the removal of selenium is neither feasible nor cost effective. Available data indicates the tests and studies used waters which have total dissolved solids (TDS) levels typically less than 1,000 mg/l. Quivira's discharge waters differ significantly from those waters, in that the Ambrosia Lake facility's TDS levels typically approximates 2,700 mg/l. A key factor in this difference is that the Ambrosia Lake water is naturally high in several common cations (sodium and calcium) and anions (sulfate, bicarbonate, and carbonate). The presence of these ions species at the higher concentrations inhibit with the selenium removal efficiencies of even the best available technological processes.

Selenium in natural water systems commonly exists as selenite (SeO_3^{2-}) and selenate (SeO_4^{2-}). Analysis of the Ambrosia Lake water has shown that its selenium composition is consistent with natural waters, with 90% being selenate and 10% selenite. However, this distribution of the selenium species further inhibits the applicability of certain technology processes.

Coagulation with filtration is reported by EPA to be 80-85% efficient in the removal of selenite.¹ Tests performed at the Ambrosia Lake facility on its discharged waters, however, indicated that only 10% of the selenium is selenite and 90% is selenate. Because this method is inefficient in the removal of selenate, it is precluded as a viable means of control.

Similarly, the lime softening process has historically been noted to be only 40-50% efficient in the removal of selenite and only 10% effective in the removal of selenate.² Because the process efficiencies are inadequate to reduce the natural selenium concentrations of the discharge water to 0.05 mg/l, this technology is also impractical.

The third technology investigated was reverse osmosis. Preliminary work indicates that due to naturally high levels of calcium and sulfate within the Ambrosia Lake water, scaling to

¹ EPA, "National Primary and Secondary Drinking Water Regulations; Proposed Rule," 54 Fed. Reg. 22105.

² EPA, "National Primary and Secondary Drinking Water Regulations; Proposed Rule," 54 Fed. Reg. 22105.

the membranes would occur, thereby reducing operating efficiencies significantly below those required to efficiently remove selenium below the livestock water quality criteria level.

The last technology investigated, activated alumina, has been, to Quivira's knowledge, lab tested only. Quivira knows of no operating installed activated alumina process for removing selenium. Available information indicates that on lab tests performed on hard groundwater in Ohio with a TDS of 608 mg/l, the selenite removals ranged from 62% to 88%, with relatively little selenate removal.³

³ Ball, R., "Removal of Selenium From Drinking Water Using Activated Alumina," Unpublished Thesis, Dep. of Civil Engineering, Univ. of Cincinnati, 1977.

EPA SHOULD CONSIDER NATURAL BACKGROUND
LOADING IN ITS § 304(l) DETERMINATIONS

EPA recognizes the importance of accounting for natural background loading in its own regulations on state water quality planning and management. See, e.g., 40 C.F.R. § 130.2(e), where the EPA indicates that a receiving water's pollution load "may be either man-caused (pollutant loading) or natural (natural background loading)." In determining Load Allocations (LA), the EPA requires that "wherever possible, natural and nonpoint source loads should be distinguished. See 40 C.F.R. § 130.2(g). The EPA also takes background loading into account in its definition of Total Maximum Daily Loads (TMDL), defined as "the sum of the individual WLAs [Waste Load Allocations] for point sources and LAs for nonpoint sources and natural background. See 40 C.F.R. § 130.2(i). LA's and TMDL's are established by the states in determining their water quality standards. Since the EPA recognizes that natural background loading must be considered in establishing water quality standards, Quivira contends that a similar recognition should be made in EPA's consideration of whether Quivira's Ambrosia Lake facility is entirely or substantially the reason why the arroyo does not allegedly meet water quality standards.

New Mexico has recognized that natural background loading should be considered in assigning a particular reach or point source to one of the four lists under § 304(l). On page 23 of its January, 1989 submittal to the EPA pursuant to § 304(l), the State, in discussing its methodology for identifying those waters which belonged on the § 304(l)(1)(A)(i) "mini" list, stated:

[w]here information was available, background loadings - e.g., loadings at a Wilderness boundary or in other undisturbed areas - were taken into consideration. In many cases, background information was not available. Consequently, the inclusion of many reaches on the mini list may be due to background loadings rather than pollution impacts. Further monitoring and assessment work will be necessary to determine the causes of impacts to their reaches.

Finally, EPA's failure to consider natural background loading in determining the question of whether a particular point source is entirely or substantially the cause of a particular reaches' inability to attain applicable water quality standards, renders an otherwise applicable regulation at 40 C.F.R. § 130.10(d)(5) not applicable in this case. Subparagraph (d)(5) provides:

APPENDIX 9

If a water meets either of the two conditions listed below the water must be listed under § 130.10(d)(2) [the (B) or short list] on the grounds that the applicable standard is not achieved or expected to be achieved due entirely or substantially to discharges from point sources

...

(ii) The discharge of a toxic pollutant from one or more point sources, regardless of any nonpoint source contribution of the same pollutant, is sufficient to cause or is expected to cause an excursion above the applicable water quality standard for the toxic pollutant.

EPA's preamble to this regulation indicates that the purpose of this language is to avoid a situation where, due to contributions of a toxic pollutant to a reach from both point and nonpoint sources, neither contribution is properly addressed, and the toxic pollution situation goes unremedied. 54 Fed. Reg. at 23,883. Because in this case, however, the arroyo's impairment is caused by natural background levels of selenium rather than from man-caused nonpoint sources, the rationale for this regulation is not applicable here, and it should not be applied.

EPA's "Final Guidance for Implementation of Requirements Under Section 304(l) of the Clean Water Act As Amended," March 1988, p. 23 states:

where additional data confirm that an observed § 307(a) toxic pollutant ambient water quality problem is not due entirely or substantially to a point source discharge of the § 307(a) toxic pollutant, then this information would serve as a basis for removing the water body from the § 304(l)(1)(B) list (the short list) and for removing the point source from the § 304(l)(1)(C) facility list. (Emphasis added).

Quivira believes it prudent and justified, based on the additional data presented in this comment, that its Ambrosia Lake facility not be included on the § 304(l)(1)(B) short list. The Ambrosia Lake facility's discharge of selenium-bearing water does not "entirely or substantially" impair water in the Arroyo del Puerto but is only a reflection of the naturally high selenium presence in this mineralized area. To include the Ambrosia Lake facility on the § 304(l)(1)(B) short list would not significantly improve the water quality in this reach, as the studies cited in

Appendices 6 and 7 indicate that naturally occurring sources throughout the area would continually contribute significant amounts of selenium, making applicable water quality standards difficult or impossible to meet.

RODEY, DICKASON, SLOAN, AKIN & ROBB, P. A.

COUNSELORS AND ATTORNEYS AT LAW

ALBUQUERQUE PLAZA

201 THIRD STREET NW, SUITE 2200

ALBUQUERQUE, NEW MEXICO 87102

P. O. BOX 1888

ALBUQUERQUE, NEW MEXICO 87103

TELEPHONE (505) 765-5900

FACSIMILE (505) 768-7395

July 5, 1990

OF COUNSEL
DON L. DICKASON
WILLIAM A. SLOAN
JACKSON G. AKIN
RAY H. RODEY

PEARCE C. RODEY (1889-1958)

SANTA FE OFFICE
MARCY PLAZA, SUITE 101
123 EAST MARCY STREET
P. O. BOX 1357
SANTA FE, NM 87504-1357
TELEPHONE 984-0100
AREA CODE 505
FACSIMILE 989-9542

WRITER'S DIRECT NUMBER

JOHN D. ROBB
JAMES C. RITCHIE
WILLIAM C. SCHAAAB
ROBERT M. ST. JOHN
JOSEPH J. MULLINS
DUANE C. GILKEY
MARK K. ADAMS
ROBERT G. MCCORKLE
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JAMES E. BURKE
DEWITT M. MORGAN
THERESA W. PARRISH

OAD

U.S. Environmental Protection Agency
Attention: Mr. Myron O. Knudson,
E.P. Director Water Management
Division (6W)

Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 754202-2733

Re: NPDES Permit No. NM0020532

Dear Mr. Knudson:

Enclosed please find copy of Appeal taken by Quivira Mining Company from your June 2, 1990 decision promulgating an individual control strategy for Quivira's facility.

Sincerely yours,

RODEY, DICKASON, SLOAN, AKIN & ROBB, P.A.

By *John D. Robb*
John D. Robb

JDR:clj
Enclosure

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JUL 09 1990

6W-EA

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- 2 - AO & AOmatl
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JONATHAN W. HEWES
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RICHARD C. MINZNER
W. ROBERT LASATER, JR.
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PAUL D. BARBER
CATHERINE T. GOLDBERG
PAUL A. COOTER
TRAVIS R. COLLIER
JO SEXTON BRAYER
S. I. BETZER, JR.
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ANGELA M. MARTINEZ
PATRICIA M. TAYLOR
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BRIAN H. LEHATTA
MARK A. SMITH
R. NELSON FRANSE
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STEVEN G. KOPELMAN
PAUL R. KOLLER
JOY READ
JAMES P. BIGG
JAY B. SIMONSON
JAY D. HILL
CHARLES J. VIGIL
MARY P. KELEHER
JAMES E. BURKE
DEWITT M. MORGAN
THERESA W. PARRISH

COUNSELORS AND ATTORNEYS AT LAW

ALBUQUERQUE PLAZA

201 THIRD STREET NW, SUITE 2200

ALBUQUERQUE, NEW MEXICO 87102

P. O. BOX 1888

ALBUQUERQUE, NEW MEXICO 87103

TELEPHONE (505) 765-5900

FACSIMILE (505) 768-7395

July 2, 1990

OF COUNSEL
DON L. DICKASON
WILLIAM A. SLOAN
JACKSON G. AKIN
RAY H. RODEY
—
PEARCE C. RODEY (1889-1958)

—
SANTA FE OFFICE
MARCY PLAZA, SUITE 101
123 EAST MARCY STREET
P. O. BOX 1357
SANTA FE, NM 87504-1357
TELEPHONE 984-0100
AREA CODE 505
FACSIMILE 989-9542

—
WRITER'S DIRECT NUMBER

By FACSIMILE and FEDERAL EXPRESS

Honorable William D. Reilly
Administrator
U.S. Environmental Protection Agency
401 M. Street, S.W.
Washington, D. C. 20460

APPEAL

Quivira Mining does hereby appeal from the June 2, 1990 decision of the Region 6 administrator:

- I. to list Quivira Mining Company and an unnamed arroyo/Arroyo del Puerto in the Section 304(L)(1)(B) and (C) lists of toxic pollutants; and
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Quivira appeals from that decision and objects to it on the grounds that the decision is arbitrary, unreasonable, illegal, contrary to the Clean Water Act and its amendments, to EPA's regulations and is otherwise discriminatory and unconstitutional. Among other reasons, it constitutes a deprivation of property of Quivira without due process of law.

With the exception of the constitutional grounds which were not specifically articulated therein, the reasons for Quivira's contentions that the actions of Region 6 are improper were set forth in some detail in the comments by Quivira to the Region's proposed actions which were previously filed herein, all of which comments are expressly adopted and reasserted herein. The decision by Region 6 is based upon conclusions which are unsupported by or contrary to both the facts and the law as described in Quivira's comments. Quivira asserts that the responses by Region 6 to its

Honorable William D. Reilly
July 2, 1990
Page 2

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- I. that the background of the naturally occurring selenium in the water and other factors indicate that Quivira is not a substantial source or cause of the alleged conditions of the arroyo;
- II. that Region 6 failed to follow the CWA and EPA regulations;
- III. that merely agreeing to permit Quivira to assert its objections to the listings in the future does not answer its claims that the damage is being inflicted on Quivira now. By branding it as a substantial polluter, it is subjecting Quivira to enormous costs in resisting the proposed individual control strategy, and in trying to get itself removed from the list of detriments and damages which would not have occurred had EPA followed legal and proper procedures in taking the actions it did; and
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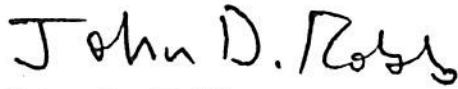
Honorable William D. Reilly
July 2, 1990
Page 3

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Respectfully submitted,

Yours very truly,

RODEY, DICKASON, SLOAN, AKIN & ROBB, P.A.

By 
John D. Robb
Attorney for Quivira Mining Company

JRD/mgw
Enclosures

MKA/mgw

RODEY, DICKASON, SLOAN, AKIN & ROBB, P. A.

COUNSELORS AND ATTORNEYS AT LAW

ALBUQUERQUE PLAZA

201 THIRD STREET NW, SUITE 2200

ALBUQUERQUE, NEW MEXICO 87102

P. O. BOX 1888

ALBUQUERQUE, NEW MEXICO 87103

TELEPHONE (505) 765-5900

FACSIMILE (505) 768-7395

July 5, 1990

OF COUNSEL
DON L. DICKASON
WILLIAM A. SLOAN
JACKSON G. AKIN
RAY H. RODEY

PEARCE C. RODEY (1889-1958)

SANTA FE OFFICE
MARCY PLAZA, SUITE 101
123 EAST MARCY STREET
P. O. BOX 1357
SANTA FE, NM 87504-1357
TELEPHONE 984-0100
AREA CODE 505
FACSIMILE 989-9542

WRITER'S DIRECT NUMBER

JOHN D. ROBB
JAMES C. RITCHIE
WILLIAM C. SCHAB
ROBERT M. ST. JOHN
JOSEPH J. MULLINS
DUANE C. GILKEY
MARK K. ADAMS
ROBERT G. MCCORKLE
PETER G. PRINA
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OAD

U.S. Environmental Protection Agency
Attention: Mr. Myron O. Knudson,
E.P. Director Water Management
Division (6W)

Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 754202-2733

Re: NPDES Permit No. NM0020532

Dear Mr. Knudson:

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By *John D. Robb*
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JDR:clj
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ALBUQUERQUE PLAZA

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P. O. BOX 1888

ALBUQUERQUE, NEW MEXICO 87103

TELEPHONE (505) 765-5900

FACSIMILE (505) 768-7395

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OF COUNSEL
DON L. DICKASON
WILLIAM A. SLOAN
JACKSON G. AKIN
RAY H. RODEY

PEARCE C. RODEY (1889-1958)

SANTA FE OFFICE
MARCY PLAZA, SUITE 101
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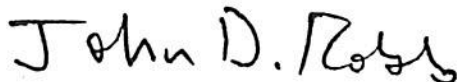
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By 
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JRD/mgw
Enclosures

MKA/mgw

N14

PIPER & MARBURY

1200 NINETEENTH STREET, N.W.

WASHINGTON, D. C. 20036

202-861-3900

TELECOPIER 202-223-2085

CABLE PIPERMAR WSH

TELEX 904246

1100 CHARLES CENTER SOUTH
36 SOUTH CHARLES STREET
BALTIMORE, MARYLAND 21201
301-539-2530

October 3, 1989

BY FEDERAL EXPRESS

Ms. Ellen Caldwell
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

OCT 6 - 1989

Re: Section 304(1) Listing
City of Las Cruces, NM
Permit No. NM-0023311

Dear Ms. Caldwell:

The City of Las Cruces, through its attorneys, hereby files these comments in response to EPA Region VI's notice dated June 4, 1989 proposing to include the City of Las Cruces on the State of New Mexico's list of point source discharges of toxic pollutants, pursuant to section 304(1) of the Clean Water Act. For the reasons set forth below, Las Cruces should not be included on the section 304(1) list.

INTRODUCTION AND SUMMARY

Section 304(1), among other things, requires states to identify those waters that are not expected to attain state water quality standards (WQS) due to toxic pollutant discharges from point sources (section 304(1)(1)(B)), and to list specific toxic discharges that are believed to be preventing or impairing attainment of state water quality criteria applicable to these waters (section 304(1)(1)(C)). EPA may add or remove water segments and toxic discharges from these lists (section 304(1)(3)).

On June 4, 1989, EPA Region VI issued a notice summarizing its decisions with respect to the lists submitted by the State of New Mexico pursuant to section 304(1). In this

notice, EPA announced its decision to add Section 2-101 of the Rio Grande, into which Las Cruces discharges, to New Mexico's section 304(1)(1)(B) list of impaired waterbodies, and to add the City of Las Cruces to New Mexico's section 304(1)(1)(C) list of toxic dischargers.

Based on materials Las Cruces obtained from Region VI, it appears that EPA used the following reasoning to support its decision to list Las Cruces: (1) In the absence of numerical state WQS, EPA Goldbook water quality criteria (WQC) should apply to Section 2-101 of the Rio Grande. (2) The 7/Q/2 flow at Section 2-101 is zero cfs. (3) Therefore, Goldbook WQC should apply directly to Las Cruces' discharge, without dilution. (4) Las Cruces' discharge of copper, lead, and mercury exceed Goldbook WQC. (5) Therefore, Las Cruces' discharge is impairing attainment of beneficial uses in the Rio Grande.

EPA's decision to list Las Cruces under section 304(1) is faulty in several respects. First, Section 2-101 is classified as a limited warm water fishery; it is, thus, inappropriate and unreasonable for EPA to have applied Goldbook WQC to this waterbody. Second, available evidence indicates that there is substantial dilution at the point of Las Cruces' discharge, even at critical low flow periods, of at least 1:5 (POTW:Stream). Third, available bioassay data indicates that Las Cruces' unchlorinated discharge does not exhibit significant acute nor chronic toxicity and is not adversely effecting Section 2-101. In short, there is no reasonable basis to list Las Cruces under section 304(1).

DISCUSSION

A. Application of EPA Goldbook Criteria To Section 2-101 Of The Rio Grande Is Unreasonable.

The State of New Mexico has not adopted quantitative water quality standards for toxics, but instead maintains a "narrative" standard that prohibits "toxics in toxic amounts" for state waters. In the face of this narrative standard, EPA apparently decided that it should apply the numerical water quality criteria set forth in the Agency's "Goldbook" to determine whether a particular waterbody in New Mexico meets state water quality standards.

While Goldbook WQS may be appropriate for certain waterbodies, it is wholly unreasonable to apply these criteria to Section 2-101 of the Rio Grande. Goldbook WQS, particularly for metals, are developed to ensure attainment of a high quality warm or cold water fishery. Section 2-101, however, is

designated as a limited warm water fishery. Such a designation is clearly proper under EPA rules (see 40 C.F.R. § 131.10(g)) because Section 2-101 is highly affected by dams and diversions and therefore cannot be expected to maintain a high quality fishery.^{1/} Indeed, inasmuch as EPA assumed Section 2-101 has a zero low flow (and thus would contain no fish during these periods), EPA's application of Goldbook WQS is patently unreasonable.

Any numerical criteria developed for Section 2-101 must comport with the attainable uses of the waterbody. In this connection, Las Cruces recently submitted to Region VI a proposal to conduct an instream biological survey of Section 2-101. Once this survey is completed, appropriate numerical criteria should be able to be established. Pending development of appropriate criteria, however, EPA cannot apply inappropriate warm or cold water fishery criteria. Accordingly, Las Cruces should not be listed under section 304(1).

B. EPA's Assumption of No Available Dilution Is Incorrect

EPA assumes that there is no available dilution of Las Cruces' discharge during critical low flow periods (i.e., Las Cruces' discharge constitutes the entire stream during these events) and, therefore, Las Cruces must meet applicable WQS at the end of the pipe. EPA's assumption of no available dilution is incorrect.

Attached as Enclosure 1 is a statistical analysis of Rio Grande flow information at two points: Leasburg Dam, and El Paso. This analysis includes both chronological flow data and 7/Q/10, 7/Q/2 and daily flow analyses at these points for different time periods. The information presented in Enclosure 1 is summarized in the table below:

^{1/} Importantly, EPA Region VI recently approved New Mexico's decision to retain the "limited warm water fishery" designation for Section 2-101 as part of the Agency's three year review of New Mexico's water quality standards. The numeric criteria approved by EPA in 1988 allow total dissolved solids of 2000 mg/l (30-day average) and, sulfate of 500 mg/l and chloride of 400 mg/l at stream flows below 350 cfs. EPA criteria documents indicate that the approved chloride level is greater than EPA's recommended chronic criteria and adverse spawning impacts may be anticipated.

Leasburg Dam

	<u>Irrigation Months</u>			<u>Non-Irrigation Months</u>		
	<u>7/Q/10</u>	<u>7/Q/2</u>	<u>Average</u>	<u>7/Q/10</u>	<u>7/Q/2</u>	<u>Average</u>
1930-72	0	10	1200	0	2	10
1972-88	10	100	1200	10	15	40
1983-88	200	500	1200	25	50	100

El Paso

	<u>Irrigation Months</u>			<u>Non-Irrigation Months</u>		
	<u>7/Q/10</u>	<u>7/Q/2</u>	<u>Average</u>	<u>7/Q/10</u>	<u>7/Q/2</u>	<u>Average</u>
1930-50	300	400	1000	120	150	250
1951-80	7	60	500	6	40	60
1981-87	130	400	900	35	70	150

As can be seen from this table, the flow regime in the Rio Grande at both stations has changed dramatically over time. While average flows have remained virtually constant over time (indicating no change in rainfall patterns), the occurrence of extreme low flows has changed. Most important, the operation of the Leasburg Dam has changed significantly since 1973. As a result, low flows have increased markedly. Stream low flows have also increased significantly since the 1950s at the El Paso station. Thus, contrary to EPA's assumption, there is substantial dilution of Las Cruces effluent available, even during critical low flow periods.

Moreover, the low flow data from Leasburg Dam actually understates the true dilution available at Las Cruces. Irrigation return flows occur downstream of Leasburg Dam but above Las Cruces. This is confirmed by the January 1989 Seepage Investigation, which concluded that approximately 27 cfs entered the Rio Grande above Las Cruces' discharge during the low flow period discussed in that report. (Enclosure 2).

Notably, the 1988 Seepage Investigation reported low flows at Las Cruces about 40 cfs higher than 1987 but the increase in flow below Leasburg dam was only 7 cfs. These data show that return flows will be greater when more diversion occurs into the canals. Thus, lower Leasburg Dam flows can be

expected to be associated with higher return flows. Overall, we believe that at least 25 cfs should be added to the low stream flows at the Leasburg Dam in determining the amount of dilution available to Las Cruces.

In sum, the attached flow information indicates that the available low flow dilution for Las Cruces' discharge is at least 50 cfs. Las Cruces' effluent averages about 10 cfs, thus, a dilution factor of at least 1:5 should be applied to Las Cruces' discharge to determine whether the discharge is preventing attainment of applicable water quality standards.

C. Available Information Indicates That Las Cruces' Effluent Does Not Cause Toxic Effects

EPA has identified three pollutants of concern in Las Cruces' discharge: copper, lead, and mercury. Two of these pollutants (copper and mercury) are present in Las Cruces' discharge in amounts greater than Goldbook WQC.^{2/} As shown below, all available evidence indicates that these pollutants are not causing toxic effects and therefore are not violating New Mexico's narrative standard of "no toxics in toxic amounts."

1. Comparison of Las Cruces Discharge to Goldbook WQC

Beginning in August 1989, Las Cruces has monitored the concentrations of copper, lead, and mercury in its effluent. The results of this monitoring can be summarized as follows:

Effluent Concentration (ug/l)

	<u>Range</u>	<u>Average</u>
Copper	46 - 280	168
Lead	ND - 11	3.80
Mercury	0.4 - 2.2	0.80

The Goldbook WQC for these pollutants (established based on a hardness of 200 mg/l) are as follows:

^{2/} As discussed above at 2, use of Goldbook WQC is not appropriate for Section 2-101.

	<u>EPA WQC (ug/l)</u>	
	<u>Acute</u>	<u>Chronic</u>
Copper	34	21
Lead	200	7.7
Mercury	2.1	0.025

Comparing Las Cruces' monitoring data with EPA Goldbook WQC, it is clear that lead is not a cause of concern, even assuming no dilution occurs. In contrast, Las Cruces' copper and mercury discharges are in excess of Goldbook WQC. Nevertheless, Las Cruces discharges of these elements are not toxic in the Rio Grande.

2. Bioassay Results

Recently, Las Cruces initiated a whole effluent toxicity (WET) testing program. Although results to date are somewhat limited, the available data indicate that Las Cruces' effluent is not toxic.

The results of Las Cruces' WET tests are attached as Enclosures 3 and 4. As can be seen from the data, the chronic tests (dechlorinated) using fathead minnows show no mortality at any dilution and only a minor amount of growth reduction at 100% effluent. The chronic no effect level is estimated at 50% effluent.

Similarly, the acute tests on Ceriodaphnia dubia indicate no acute effects at 30% effluent. The no effect level for Ceriodaphnia dubia was projected to be 50% effluent.

These results are striking and contrary to what EPA's information would predict^{3/}. Significant Ceriodaphnia mortality should have been seen at 30% effluent, but was not. Similarly, significant chronic toxicity was expected for fathead minnows, but only limited toxicity was found.

The absence of more substantial toxic effects strongly suggests that the copper and mercury contained in Las Cruces effluent are not in a form that is biologically available. It

^{3/} See the LC50s and NOEL/LOEL figures for Ceriodaphnia and fathead minnows set forth in Table 3 of EPA's Goldbook criteria documents for copper and mercury.

is well recognized, for example, that only the acid-soluble fraction of most metals poses toxicity problems; particulate and non-soluble metal species are not taken up by organisms.

3. 1988 Stream Study

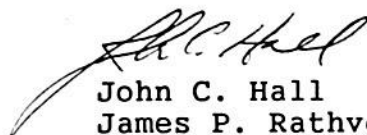
The bioassay data developed by Las Cruces showing no toxicity is corroborated by a recent instream study conducted in August 1988. That report (attached as Enclosure 5) concludes that Las Cruces' discharge is not adversely impacting the Rio Grande.

CONCLUSION

The available data do not support a finding that Las Cruces has violated the State's narrative toxic standard. The data demonstrate that significant dilution is available. Moreover, the low flows assumed by Region VI in the analysis have not occurred in over fifteen years and there is no reason to believe they will occur in the future.

It is not reasonable to assume that WQC violations are occurring when they have not actually occurred. Lead is clearly not a problem even assuming application of Goldbook WQC. The ultimate decision on the need for reduction in copper or mercury should be based on the continuing bioassay and instream studies. These studies should confirm whether any chronic or acute problems are affecting the beneficial uses of the Rio Grande below Las Cruces. As such, Las Cruces should not be placed on the section 304(1) list at this time.

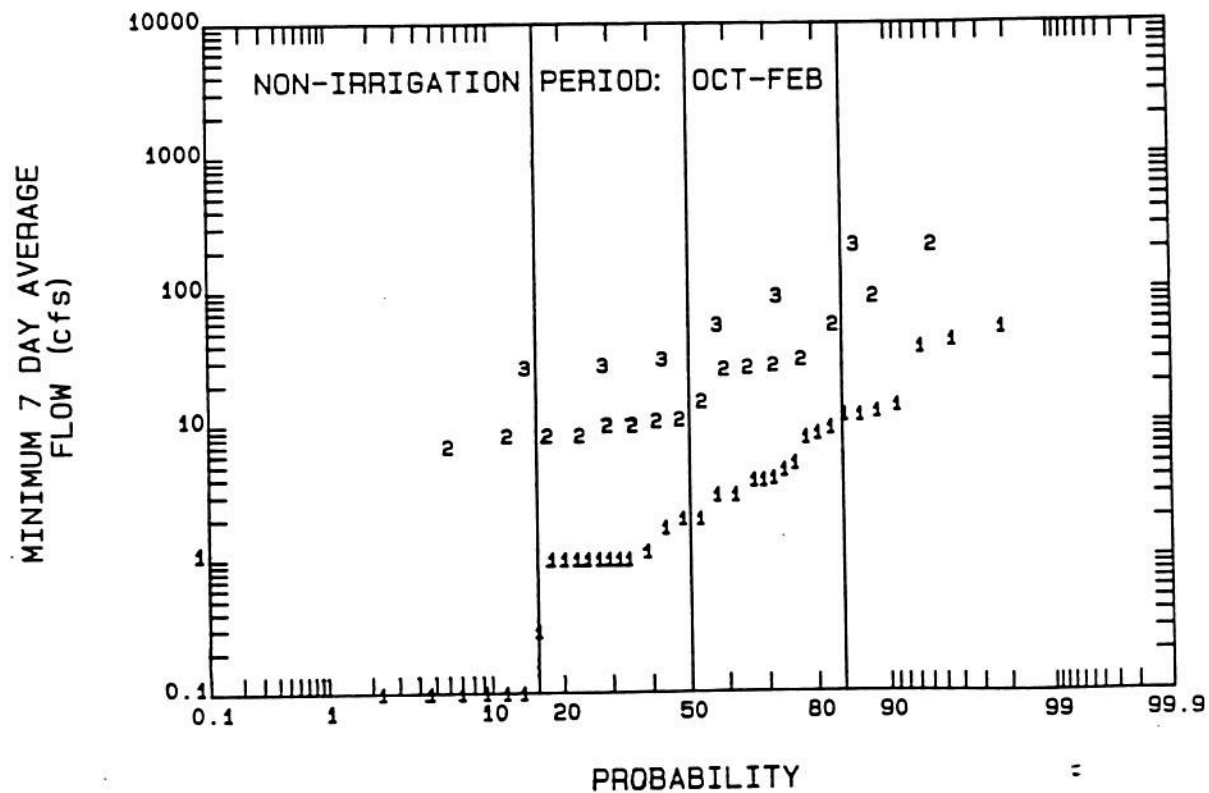
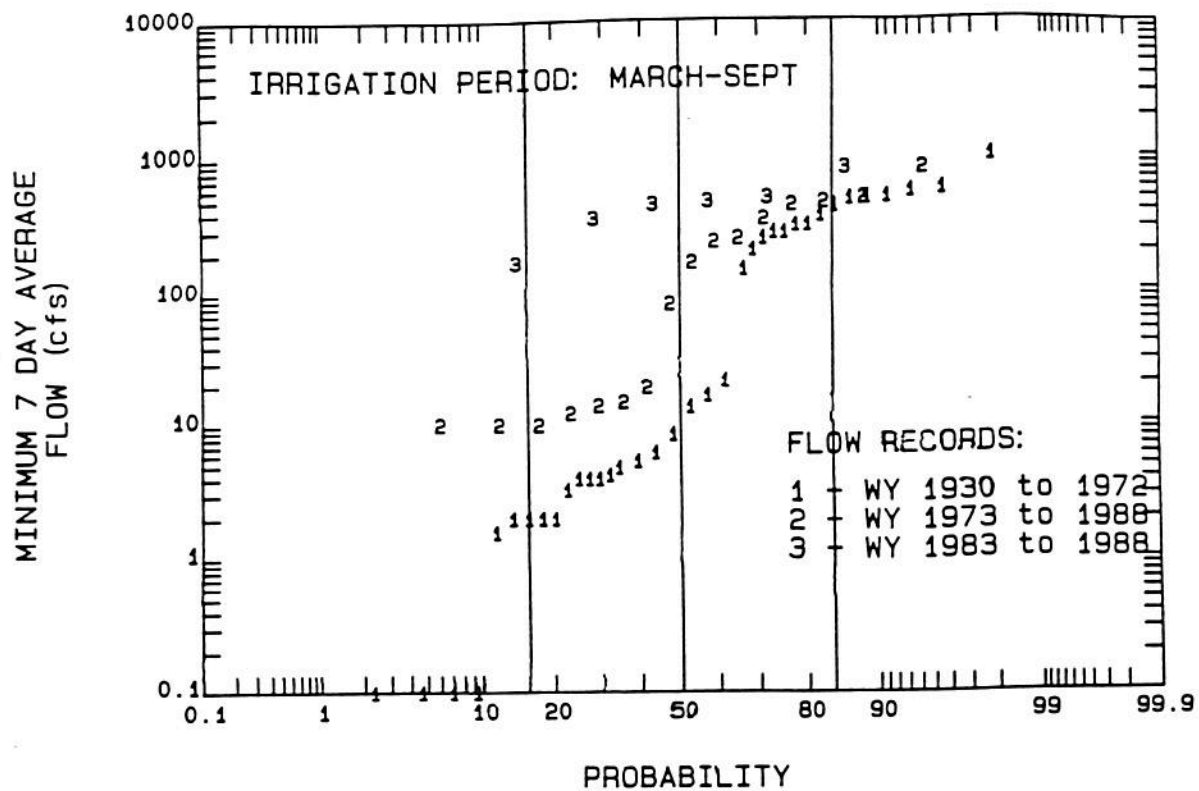
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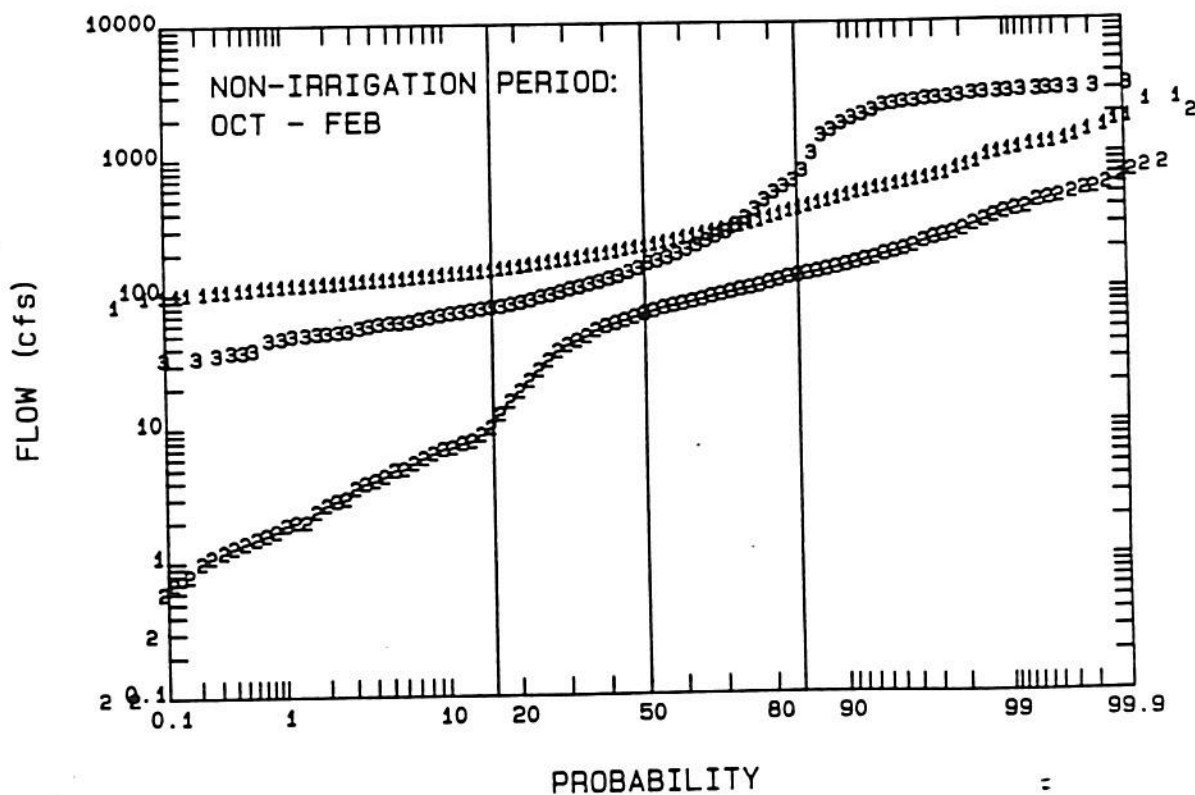
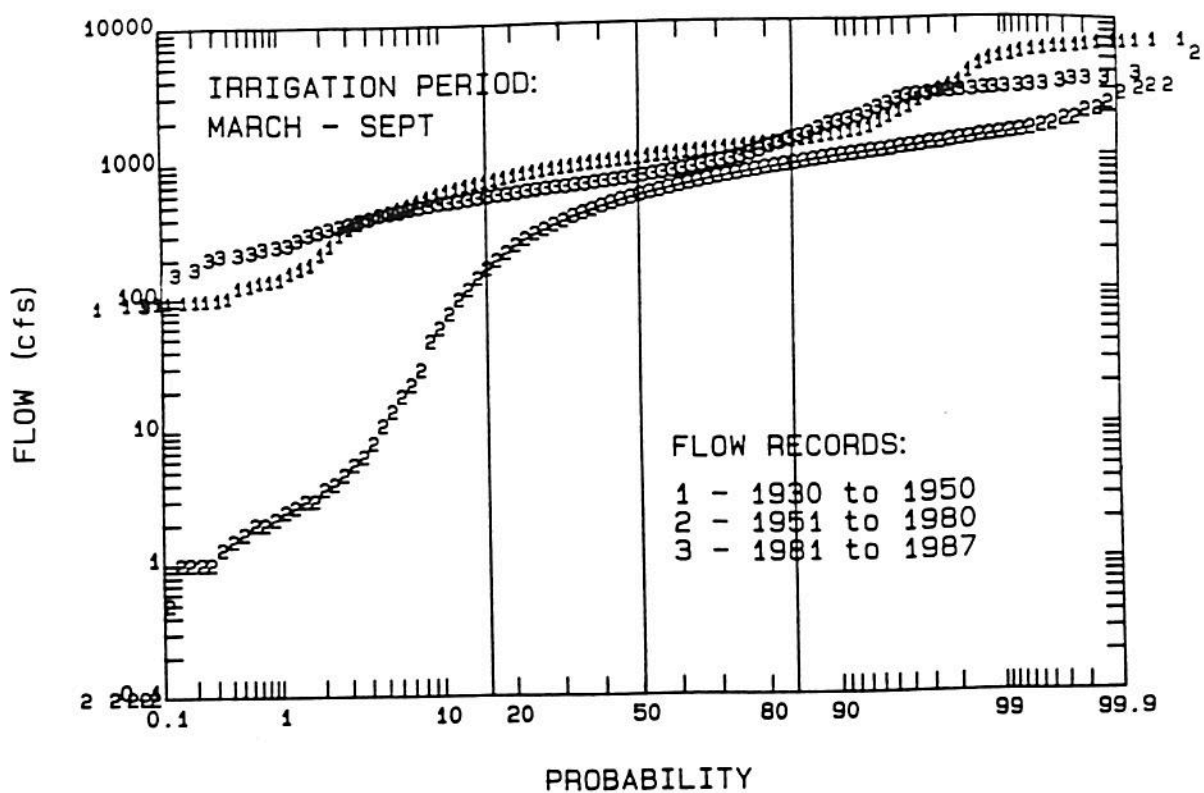
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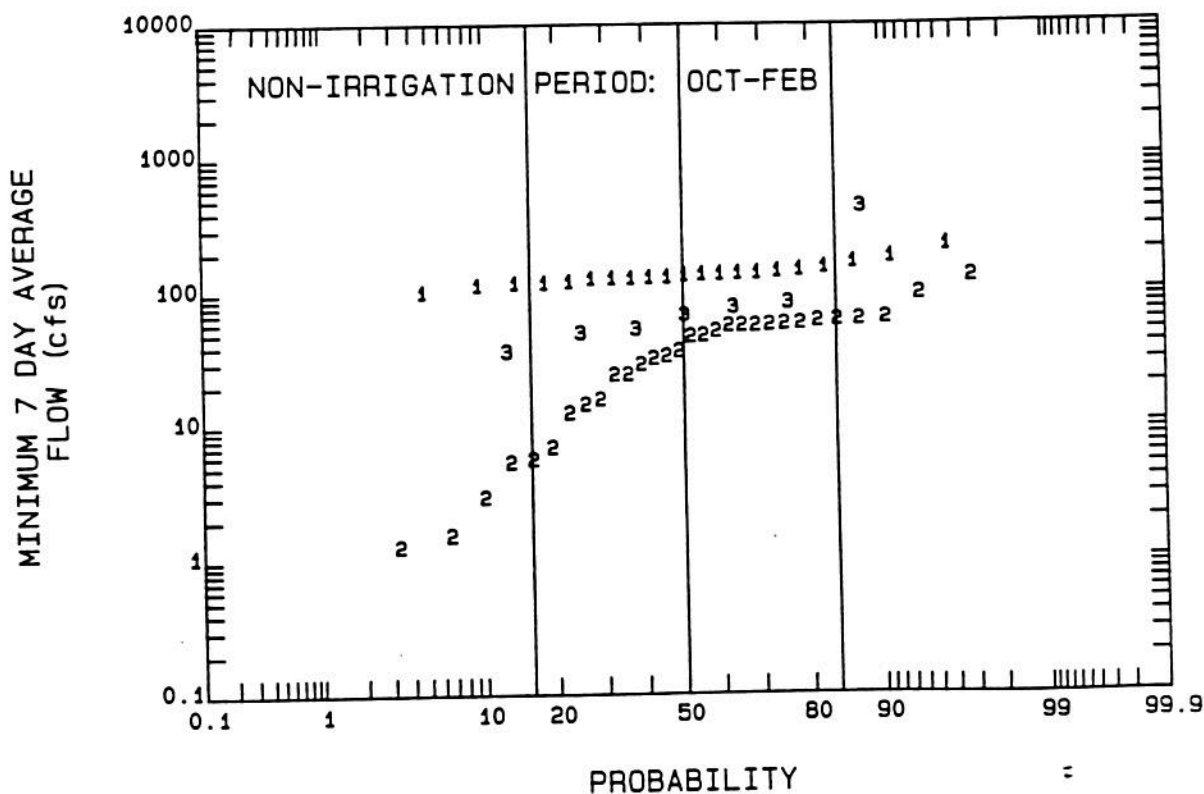
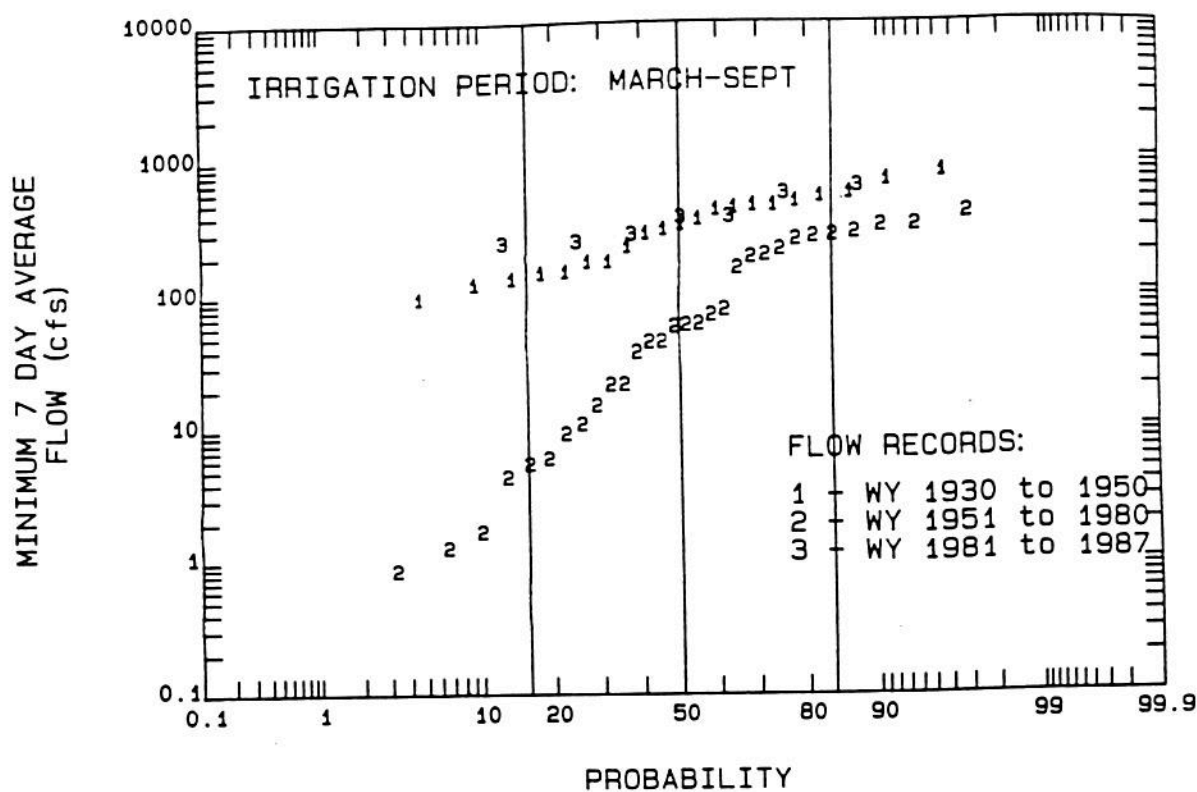
cc: Kathleen M. Sisneros, State of New Mexico
D. Craig Andrews, P.E., City of Las Cruces
Kenneth M. Needham, City of Las Cruces



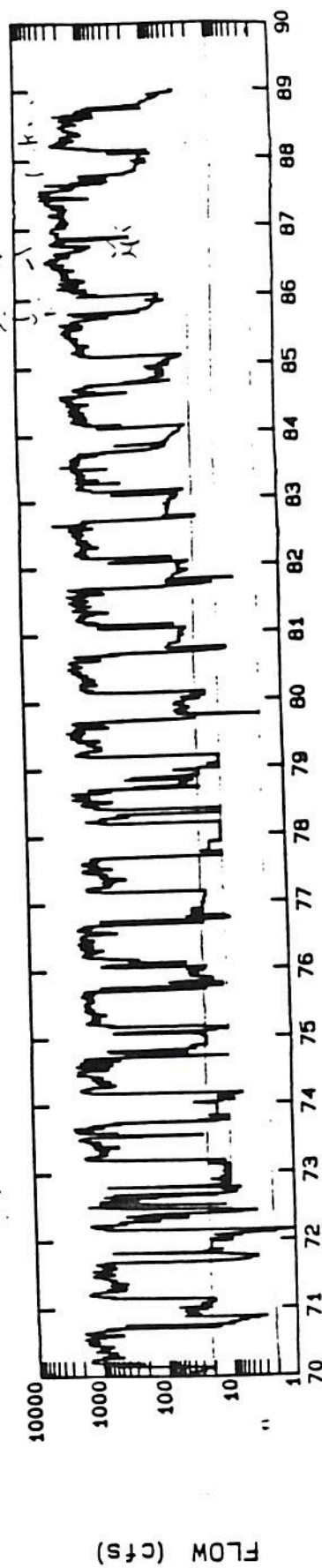
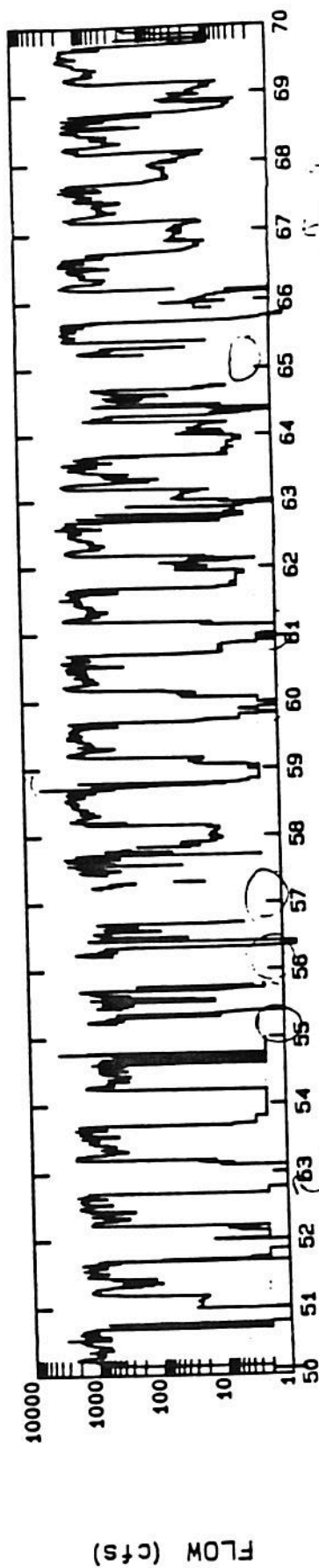
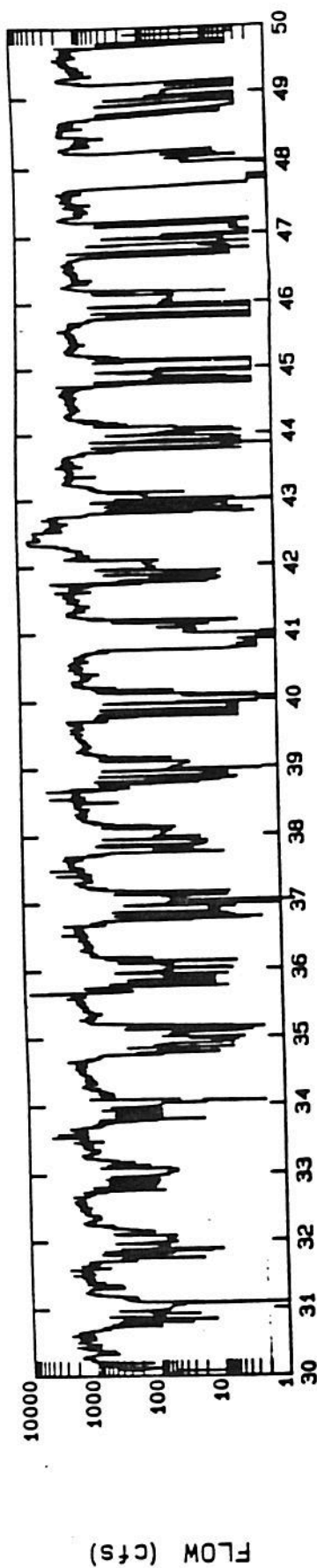
RIO GRANDE AT LEASBURG DAM 7Q10 FLOW ANALYSIS: 1930-1988



RIO GRANDE AT EL PASO DAILY FLOW: 1930-1987

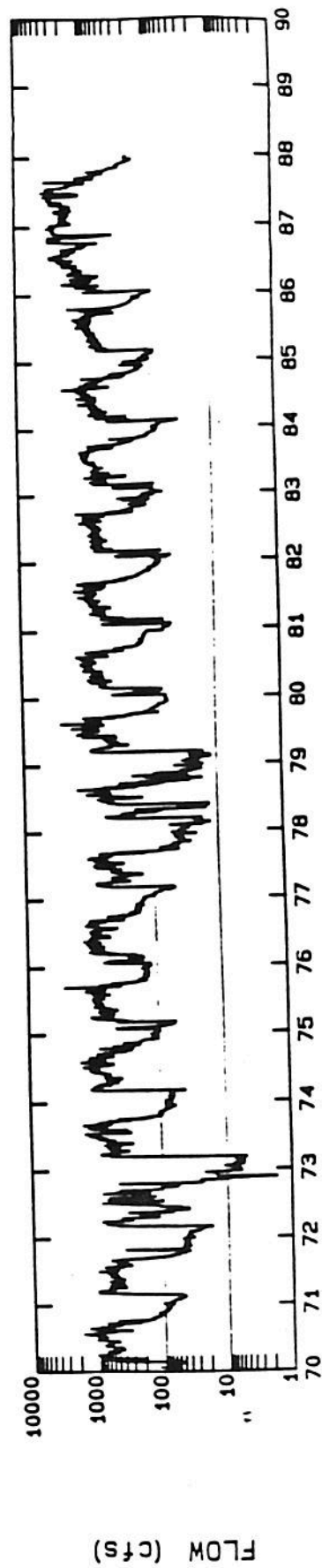
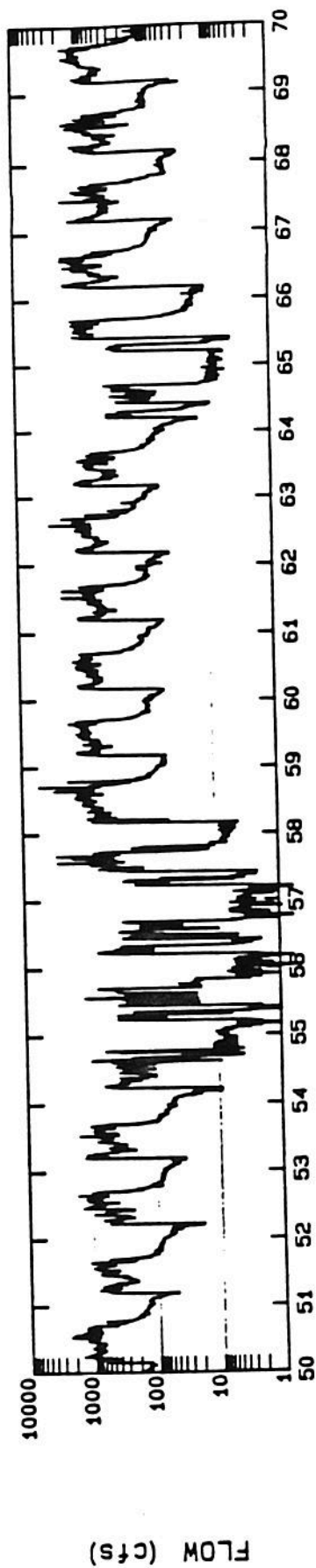
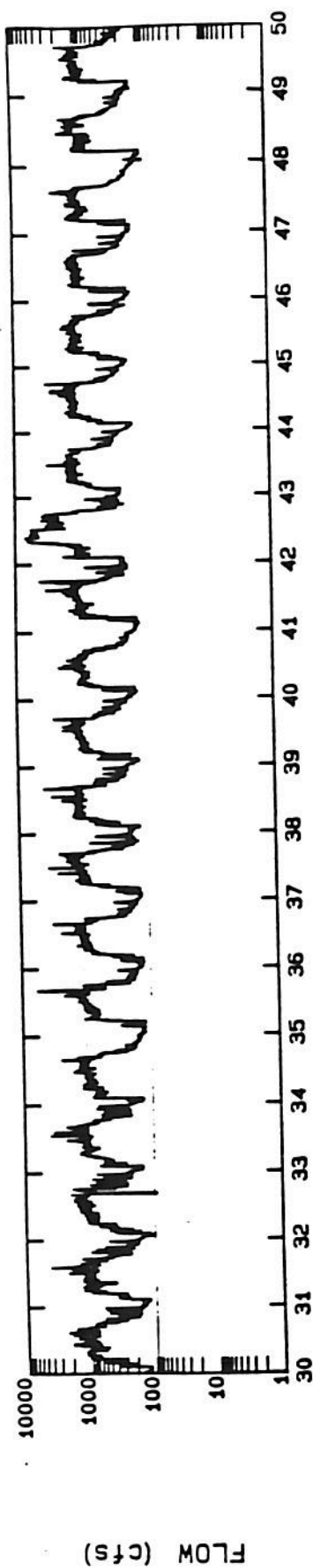


RIO GRANDE AT EL PASO 7Q10 FLOW ANALYSIS: 1930-1987



CHRONOLOGICAL FLOW - RIO GRANDE RIVER AT LEASBURG DAM

< 0 values are overflowed



CHRONOLOGICAL FLOW - RIO GRANDE RIVER AT EL PASO

PRELIMINARY, SUBJECT TO REVISION

Revised 3/20/89

SEEPAGE INVESTIGATIONS RIO GRANDE BASIN

Rio Grande seepage investigation—Radium Springs, New Mexico to El Paso, Texas

REACH.—The seepage investigation was conducted along a 62.4 mile reach from the Rio Grande below Leasburg Dam near Radium Springs, New Mexico to the Rio Grande at El Paso, Texas (08364000). River miles are referenced upstream from the Rio Grande at El Paso, Texas; which is designated as river mile 0.0.

DATE.—January 10-11, 1989.

WEATHER.—No measurable precipitation occurred since January 4 (0.02-inch). Air temperatures were lower than normal during the seepage investigation. Temperature extremes at Las Cruces, New Mexico ranged from a low of -8 degrees Celsius on January 10 at 0700 hours to a high of 20 degrees Celsius on January 11 at 1500 hours.

STREAMFLOW.—The seepage investigation was conducted during a period of constant base flow. Discharge measurements indicate a net seepage loss of 7.2 cubic feet per second from river mile 62.4 to river mile 0.0. Indicated gains and losses throughout the reach are shown in table 1. Tributary flow recorded as inflow is considered a contribution and not a gain: no outflow (diversions) occurred during the investigation. Evaporation from the water surface of the river in January is considered negligible.

WATER QUALITY.—Chemical analyses of water samples collected from the Rio Grande (6 sites) during the seepage investigation are listed in table 2. Water samples were analyzed for major ions, selected nutrients, and selected trace metals.

GROUND-WATER LEVELS.—Ground-water levels were measured during the seepage investigation. Water levels in selected observation wells completed in the shallow flood-plain alluvium are listed in table 3.

REMARKS.—The seepage investigation is rated poor based upon unsteady streamflow. Temperature extremes during the investigation resulted in diurnal fluctuations in river stage. Shore-ice was observed at many of the discharge measurement sites. Recorded river stage in the Rio Grande at NM-227 Bridge near Vado, New Mexico (site 17) indicates a change in gage-height from -0.36 feet on January 10 at 1530 hours to -0.44 feet on January 11 at 1045 hours. Individual discharge measurements were rated good (within 5 percent) to fair (within 8 percent); accuracy of discharge measurements should be considered when evaluating indicated gains and losses. A previous seepage investigation of this reach was conducted by the U.S. Geological Survey on January 5-6, 1988.

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Table #.--Rio Grande seepage investigation from Radium Springs, New Mexico to El Paso, Texas on January 10-11, 1989

Site No.	River	Stream	Location	Date	Time (°C)	Specific con-duc-tance (uS/cm)	Discharge, in ft ³ /s		
							Water temper-ature	Main stream	Gain or loss
1	62.4	Rio Grande	Below Leasberg Dam near Radium Springs, NM Lat 32°28'41", long 106°55'10"	01-10-89	1105	4	1,500	33.1	--
2	60.3	Rio Grande	Near Leasburg, NM Lat 32°27'21", long 106°54'08"	01-10-89	1225	7	1,570	38.9	+5.8
3	57.7	Selden Drain	Near Leasburg, NM Lat 32°25'38", long 106°52'50"	01-10-89	1320	5	1,270	1/0.2	--
4	56.4	Rio Grande	Near Hill, NM Lat 32°25'05", long 106°52'01"	01-10-89	1405	9	1,700	48.8	+9.7
5	52.8	Rio Grande	At Shalem Bridge near Dona Ana, NM Lat 32°22'34", long 106°51'16"	01-10-89	1520	8.5	1,650	51.5	+2.7
6	51.3	Wasteway No. 5	Near Dona Ana, NM Lat 32°22'14", long 106°50'14"	01-10-89	1545	9	1,780	1/0.1	--
7	48.9	Rio Grande	Near Picacho, NM Lat 32°20'18", long 106°50'09"	01-10-89	1040	2	1,710	54.5	+2.9

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Table 8.--Rio Grande seepage investigation from Radium Springs, New Mexico to El Paso, Texas on January 10-11, 1989--Continued

Site River No. Mile	Stream	Location	Date	Time (°C)	Specific con- duc- tance (uS/cm)	Discharge, in ft ³ /s			
						Water temper- ature	Main stream	In- flow loss	
8	45.7	Rio Grande	Below Picacho Bridge near Las Cruces, NM	01-10-89	1200	5	1,670	60.6	+6.1
			Lat 32°17'45", long 106°49'25"						
9	45.5	Wastewater Inflow	City of Las Cruces, NM	01-10-89	1205	10	1,270	2/10.0	--
			Lat 32°17'35", long 106°49'26"						
10	43.2	Rio Grande	At NM-359 Bridge near Mesilla, NM	01-10-89	1330	8	1,620	55.1	-15.5
			Lat 32°15'49", long 106°49'29"						
11	41.9	Picacho Drain	Above Mesilla Dam	01-10-89	1410	8	1,500	2.86	--
			Lat 32°14'34", long 106°48'56"						
12	41.8	Rio Grande	Below Picacho Drain	01-10-89	1500	8	1,580	33.4	-24.6
			Lat 32°14'30", long 106°48'49"						
13	39.6	Rio Grande	Below Mesilla Dam	01-10-89	1150	5	1,580	44.5	+11.1
			Lat 32°13'17", long 106°47'15"						
14	37.4	Rio Grande	At NM-28 Bridge near San Pablo, NM	01-10-89	1250	4	1,620	43.3	-1.2
			" Lat 32°12'24", long 106°45'32"						
15	33.7	Santo Tomas River Drain	Near San Miguel, NM	01-10-89	1310	--	--	0	--
			Lat 32°10'16", long 106°43'11"						

**PRELIMINARY
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Table #.--Rio Grande seepage investigation from Radium Springs, New Mexico to El Paso, Texas on January 10-11, 1989--Continued

Site No.	River Mile	Stream	Location	Date	Time (°C)	Specific con- duc- tance (uS/cm)	Discharge, in ft ³ /s		
							Water temper- ature	Main stream flow	Gain or loss
16	32.8	Rio Grande	At NM-228 Bridge near San Miguel, NM Lat 32°09'43", long 106°42'58"	01-10-89	1425	7	1,580	45.0	+1.7
17	27.9	Rio Grande	At NM-227 Bridge near Vado, NM Lat 32°06'48", long 106°40'05"	01-10-89	1530	7	1,520	50.4	+5.4
				01-11-89	1045	3	1,540	42.4	--
18	26.7	Del Rio Drain	Near Vado, NM Lat 32°06'09", long 106°39'27"	01-11-89	1215	9	1,300	33.2	--
19	23.9	Rio Grande	At NM-226 Bridge near Berino, NM Lat 32°03'56", long 106°39'45"	01-11-89	1310	10	1,460	70.1	-5.5
20	21.7	La Mesa Drain	Near Chamberino, NM Lat 32°02'15", long 106°39'23"	01-11-89	1415	10	1,900	12.0	--
21	21.6	Rio Grande	Below La Mesa Drain near Chamberino, NM Lat 32°02'12", long 106°39'18"	01-11-89	1530	11	1,650	90.3	+8.2
22	18.6	Rio Grande	" At NM-225 Bridge near Anthony, NM Lat 31°59'58", long 106°38'07"	01-11-89	1100	4	1,530	80.6	-9.7
23	15.5	East Drain	Near Vinton, TX Lat 31°58'09", long 106°36'17"	01-11-89	1150	6	3,100	8.59	--

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Table #.—Rio Grande seepage investigation from Radium Springs, New Mexico to El Paso, Texas on January 10-11, 1989--Continued

Site No.	River	Stream	Location	Date	Time (°C)	Water temperature (°C)	Specific conductance (uS/cm)	Discharge, in ft ³ /s		
								Main stream	In-flow	Gain or loss
24	14.8	Rio Grande	At Vinton Bridge near Vinton, TX Lat 31°57'33", long 106°36'16"	01-11-89	1330	8	1,680	101		+11.8
25	11.7	Rio Grande	At TX-259 Bridge, Canutillo, TX Lat 31°54'54", long 106°36'06"	01-11-89	1440	8	1,670	105		+4
26	9.4	Rio Grande	At Borderland Bridge near Borderland, TX Lat 31°53'09", long 106°35'55"	01-11-89	1540	9	1,680	91.0		-14.0
27	6.3	Rio Grande	At TX-260 Bridge near Santa Teresa, NM Lat 31°50'46", long 106°36'18"	01-11-89	1130	4	1,740	87.9		-3.1
28	2.9	Rio Grande	Near Sunland Park, NM Lat 31°48'24", long 106°34'57"	01-11-89	1315	7.5	1,750	82.3		-5.6
29	1.1	Wastewater Inflow	Sunland Plant, City of Sunland Park, NM Lat 31°47'55", long 106°33'25"	01-11-89	1430	18	1,750		0.9	—
30	1.0	Rio Grande	At Sunland Park Bridge, Sunland Park, NM Lat 31°47'56", long 106°33'16"	01-11-89	1415	9	1,680	87.5		+4.3
31	0.4	Montoya Drain	Near Sunland Park, NM Lat 31°48'10", long 106°32'47"	01-11-89	1620	11	2,260		36.2	—

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**PRELIMINARY
SUBJECT TO REVISION**

Table #.--Rio Grande seepage investigation from Radium Springs, New Mexico to El Paso, Texas on January 10-11, 1989--Concluded

Site No.	River Mile	Stream	Location	Date	Time (°C)	Specific			Discharge, in ft ³ /s	
						Water temper- ature	con- duc- tance	Gain or loss	Main stream	In- flow
32	0.2	Keystone Reservoir Outlet	Near El Paso, TX Lat 31°48'18", long 106°32'39"	01-11-89	1625	--	--	0.04	--	--
33	0.0	Rio Grande	At Courchesne Bridge, El Paso, TX Lat 31°48'09", long 106°32'26"	01-11-89	1510	10	1,975	122	--	-1.7

1/ Estimated discharge

2/ Reported mean daily discharge



United States Department of the Interior

GEOLOGICAL SURVEY

Water Resources Division
Box 30001 - Department 3167
Las Cruces, NM 88003-0001

February 11, 1988

Mr. Jake Hand
City of Las Cruces
Wastewater Department
P.O. Drawer CLC
Las Cruces, NM 88004

Dear Mr. Hand:

Preliminary results of the Rio Grande seepage investigation from Radium Springs, New Mexico to El Paso, Texas conducted on January 5-6, 1988 are attached. Discharge measurement sites are referenced by site number and are located on the attached map. Water quality samples were collected at site number 1,8,13,17,25 and 35. Water samples were sent to the U.S. Geological Survey lab in Denver, Colorado for analysis of major ions and trace metals. I do not expect lab results until late February or early March.

Sincerely,

Edward Nickerson

Edward L. Nickerson
Hydrologist

ELN:emm

Attachments

Rio Grande seepage investigation, from Radium Springs, New Mexico to El Paso, Texas, on January 5-6, 1988. PRELIMINARY 1/4
SUBJECT TO REVISION

Site No.	River Mile	Stream	Location	Date	Time	Water Temp (°C)	Specific Conductance (µS/cm)	Discharge, in Main stream	Discharge, in ffl/s	Inflow	Outflow	Gain or Loss
1	67.4	Rio Grande	Below Lensburg, Dom. near Radium Springs, NM Lat 32° 28' 41" N, Long 106° 55' 10" W	01-05-88	0900	16	1100	195.1				—
2	60.3	Rio Grande	Near Lensburg, NM	01-05-88	1025	7	1100	95.5				+0.4
3	57.7	Selden Drain	Near Lensburg, NM	01-05-88	1125	7	11450			0.3		—
4	56.4	Rio Grande	Near Hill, NM	01-05-88	1200	8	1250	98.9				+3.1
5	52.8	Rio Grande	At Shalem Bridge near Donna Ann, NM	01-05-88	1305	8.5	1300	105				+6.1
6	51.3	Wasteway No. 5	Near Donna Ann, NM	01-05-88	1350	11	1850			0.1		—
7	48.9	Rio Grande	Near Puccho, NM	01-05-88	0900	5.5	1300	102				-3.1
8	45.7	Rio Grande	Below Puccho Bridge near Las Cruces, NM Lat 32° 17' 45" N, Long 106° 49' 25" W	01-05-88	1030	7	1300	102				0
9	45.5	Wastewater Inflow	City of Las Cruces, NM	01-05-88	1130	16	1100			9.6		—
10	43.2	Rio Grande	At NM-359 Bridge near Mesilla, NM	01-05-88	1145	8	1300	113				+1.4
11	41.9	Puccho Drain	Above Mesilla Dam	01-05-88	1300	9	1500			3.5		—

PRELIMINARY
SUBJECT TO REVISION

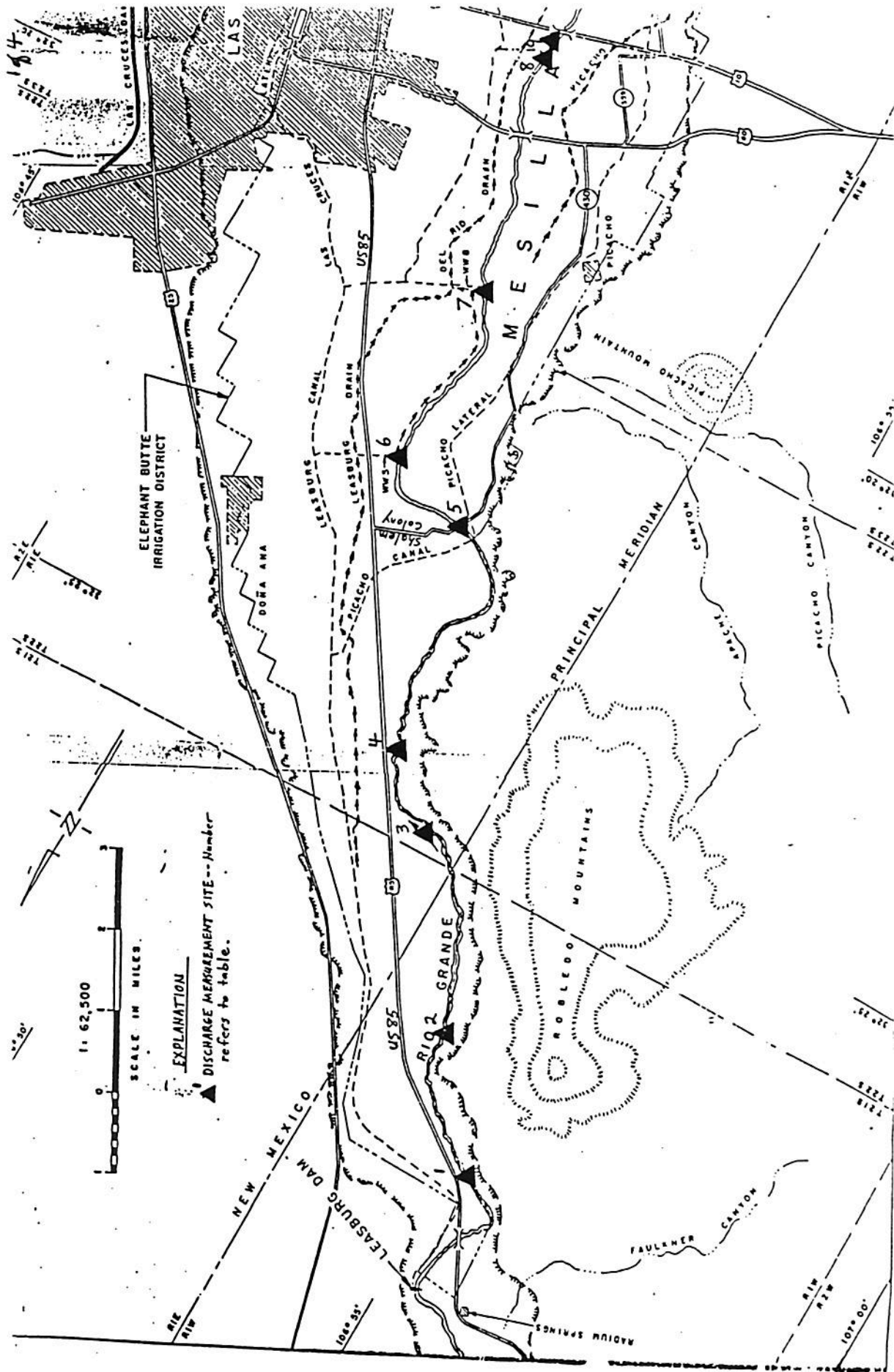
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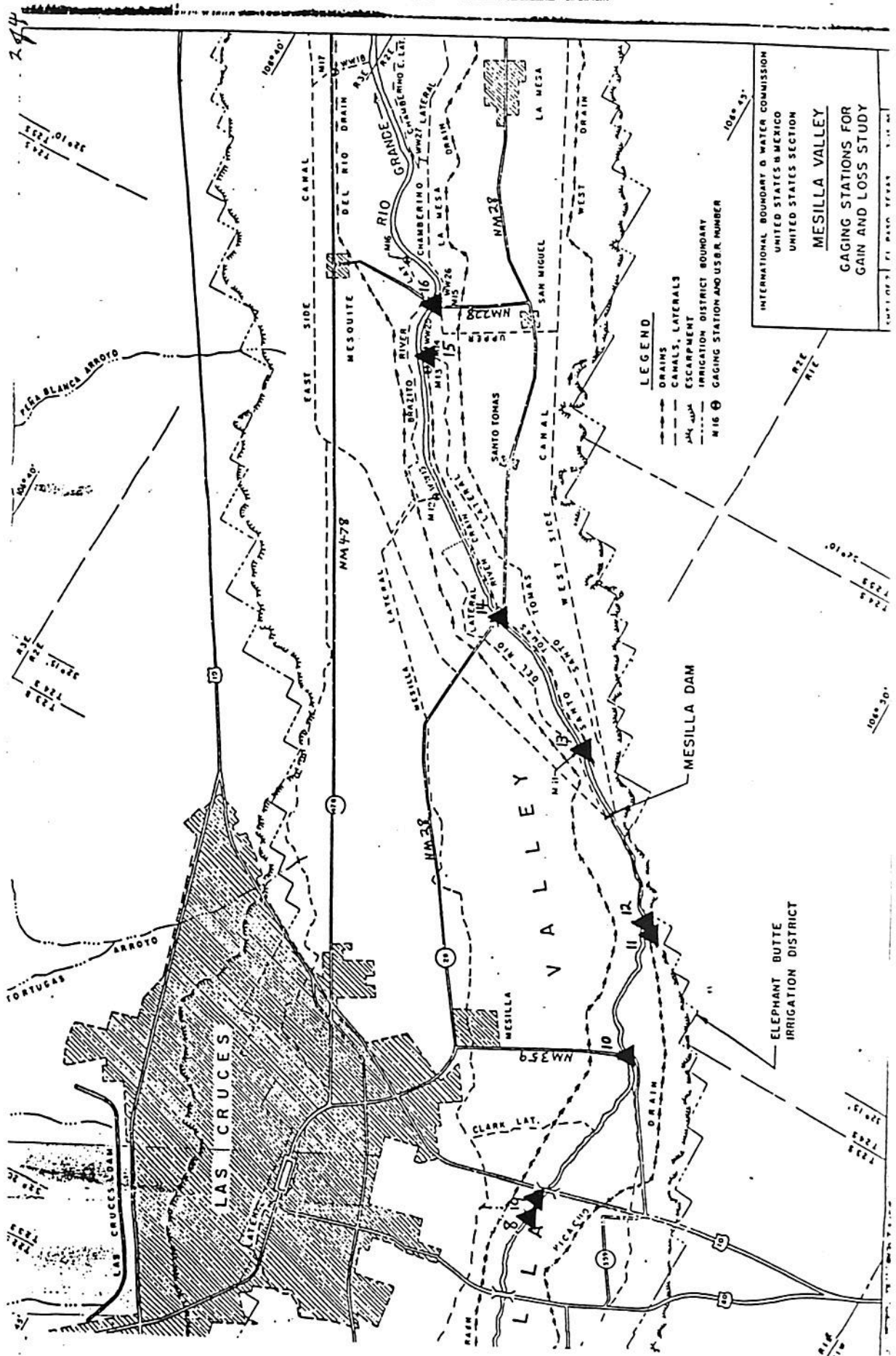
Site No.	River Mile	Stream	Location	Date	Time	Water Temp (°C)	Specific Conductance (µS/cm)	Discharge, in ft^3/s Main Stream	Discharge, in ft^3/s Outflow	Gain or Loss
12	41.8	Rio Grande	Below Pueblo Drive	01-05-88	1620	9	1250	195		-1.5
13	39.6	Rio Grande	Below Mesilla Dam Lat 32°31'17", long 106°47'15"	01-06-88	0730	4	1250	100		-15
14	37.4	Rio Grande	At NM-28 Bridge near San Pablo, NM	01-06-88	0930	6	1250	103		+3
15	33.7	Santo Tomas River Drain	Near San Miguel, NM	01-06-88	1035	—	—	0		—
16	32.8	Rio Grande	At NM-228 Bridge near San Miguel, NM	01-06-88	0930	8	1250	100		-3
17	27.9	Rio Grande	At NM-227 Bridge near Vado, NM Lat 32°06'48", long 106°40'05"	01-06-88	0815	8.5	1250	91.2		-8.8
18	26.7	Del Rio Drain	Near Vado, NM	01-06-88	0955	13	1300	36.4		—
19	23.9	Rio Grande	At NM-226 Bridge near Berino, NM	01-06-88	1105	12	1300	131		+3.4
20	21.7	La Mesa Drain	Near Chamberino, NM	01-06-88	1245	14	1900	12.6		—
21	21.6	Rio Grande	Below La Mesa Drain near Chamberino, NM	01-06-88	1340	14	1350	149		+5.4
22	18.6	Rio Grande	At NM-225 Bridge near Anthony, NM	01-06-88	1030	11	1350	163		+14

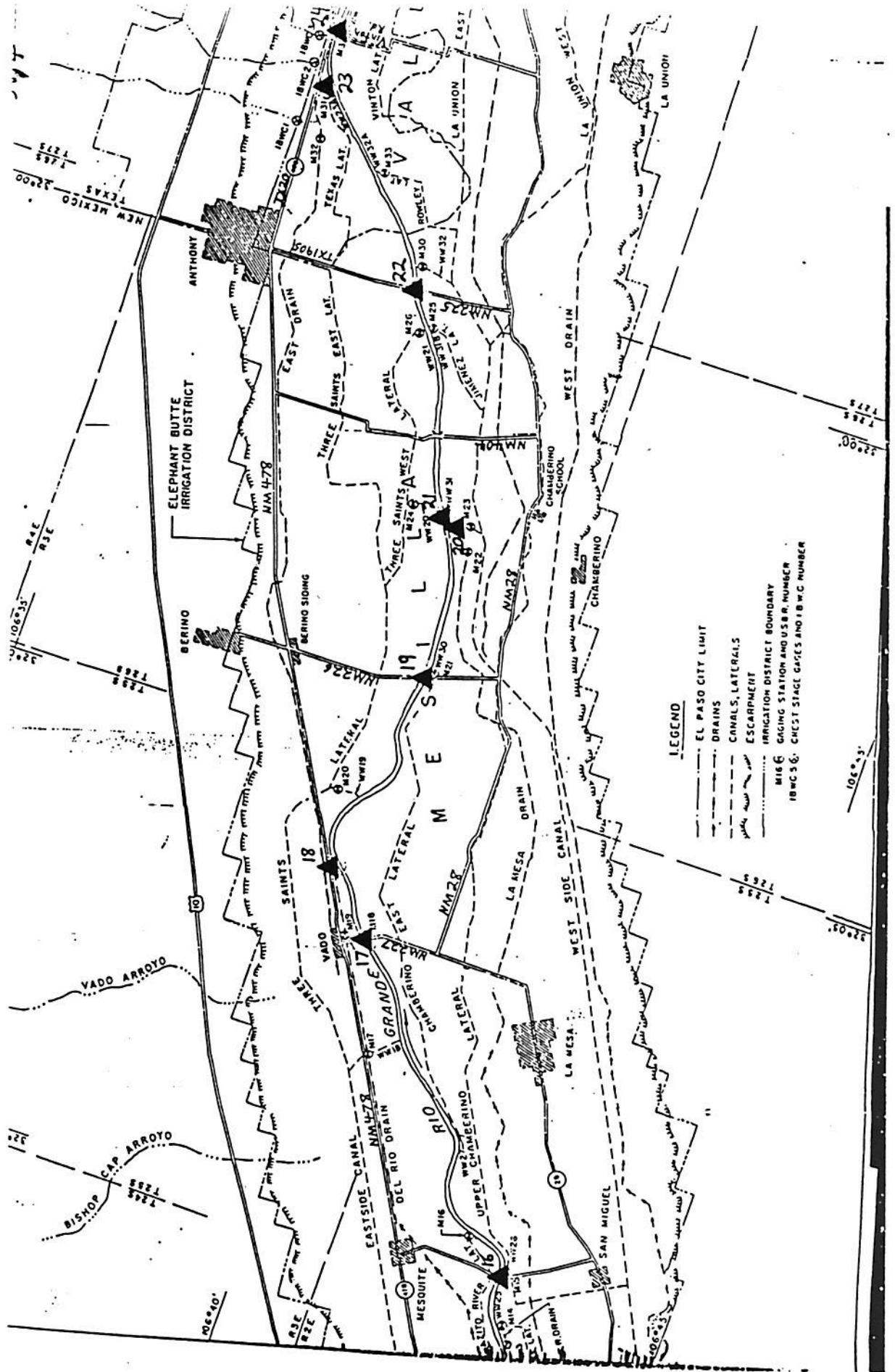
PRELIMINARY 394
SUBJECT TO REVISION

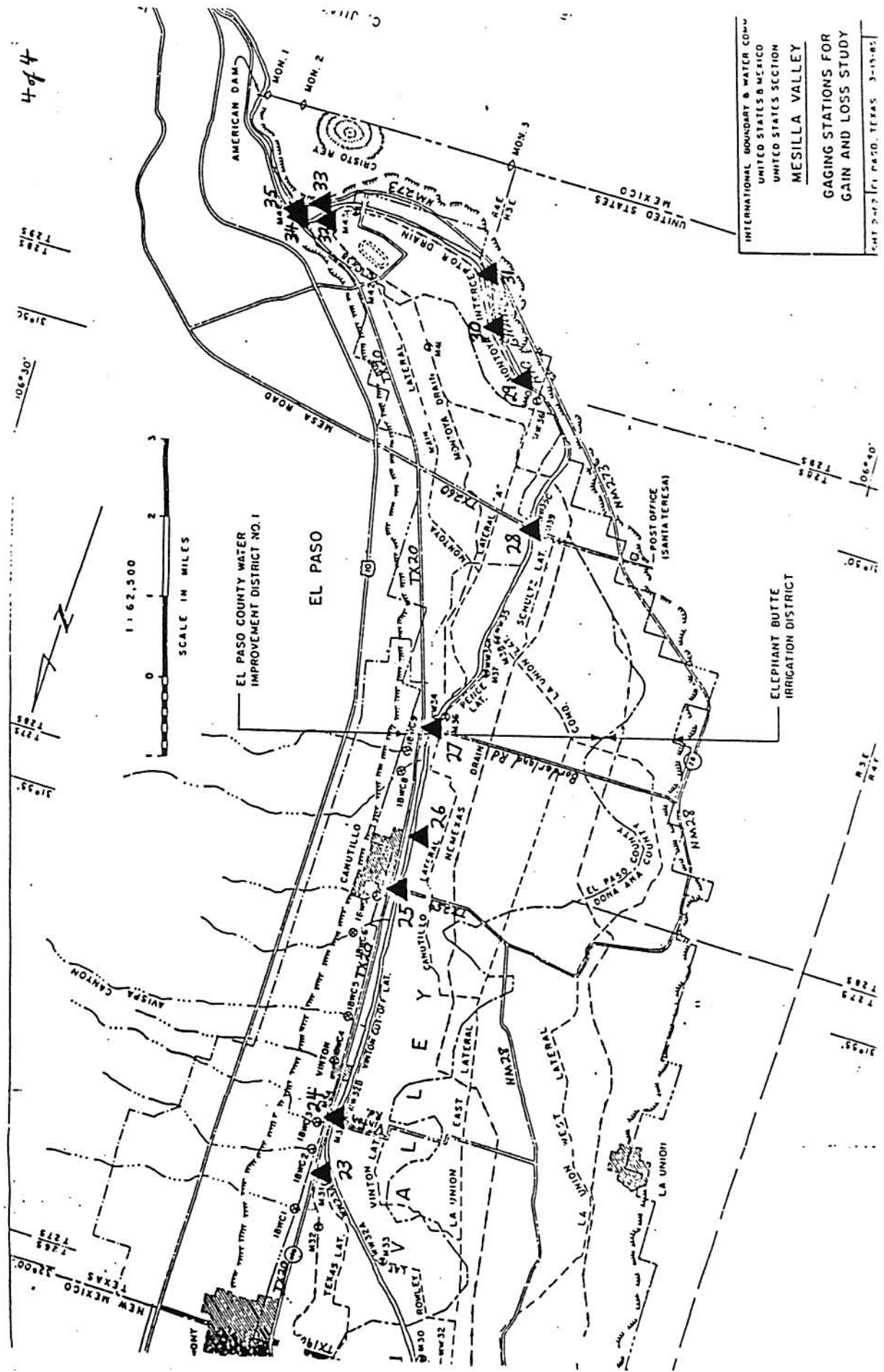
Site No.	River Mile	Stream	Location	Date	Time	Water Temp (°C)	Specific Conductance (µS/cm)	Discharge in Main Stream	Inflow	Outflow	Gain or Loss
23	15.5	East Drain	Near Vinton, TX	01-06-88	1135	17	3050	11.2			-
24	14.8	Rio Grande	At Vinton Bridge near Vinton, TX	01-06-88	1215	17	1400	170			-4.2
25	11.7	Rio Grande	At TX-259 Bridge, Canutillo, TX Lat 31°54'54", Long 106°36'06"	01-06-88	1315	17	1500	171			+1
26	10.9	Temporary Well Inflow	Near Canutillo, TX	01-06-88	—	—	—	217.6			—
27	9.4	Rio Grande	At Borderland Bridge near Borderland, TX	01-06-88	1415	13.5	1500	160			-18.6
28	6.3	Rio Grande	At TX-260 Bridge near Santa Teresa, NM	01-06-88	1135	11.5	1500	153			-7
29	3.5	Wastewater Inflow	Riverside Plant, City of Sunland Park, NM	01-06-88	—	—	—	210.05			—
30	2.9	Rio Grande	Near Sunland Park, NM	01-06-88	1255	11	1450	139			-14
31	2.5	Wastewater Inflow	Sunland Plant, City of Sunland Park, NM	01-06-88	—	—	—	210.14			—
32	0.4	Montoya Drain	Near Sunland Park, NM	01-06-88	1425	14	2600	42.9			—
33	0.4	Temporary Well Inflow	At Sunland Park, NM	01-06-88	1530	—	—	210.5			—

Site No.	River Mile	Stream	Location	Date	Time	Water Temp. (C)	Specific Conductance (uS/cm)	Discharge, in Main Stream	Discharge, in CFS	Inflow	Outflow	Gain or Loss
34	0.1	Keystone Reservoir Outlet	Near El Paso, TX	01-06-88	1550	—	—	—	—	—	—	—
35	0.0	Rio Grande	At Conchesne Bridge, El Paso, TX Lat 31°48'09", Long 106°32'26"	01-06-88	1530	13	1900	194	—	0.2	—	+11.8
<p>1) Estimated discharge.</p> <p>2) Reported mean daily discharge.</p> <p>3) Temporary well inflow from shallow wells completed in the flood-plain alluvium within 500 feet of the Rio Grande. Wells were pumped for the purpose of dewatering at construction sites.</p>												









INTERNATIONAL BOUNDARY & WATER COMMISSION
 UNITED STATES & MEXICO
 UNITED STATES SECTION
 MESILLA VALLEY
 GAGING STATIONS FOR
 GAIN AND LOSS STUDY
 CHIT 2-27-71 PASO, TEXAS 3-15-82

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